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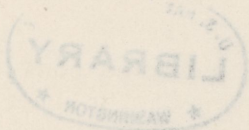
March 10, 1972

OBSERVATIONS OF THE SUN, MOON, AND PLANETS

SIX-INCH TRANSIT CIRCLE RESULTS

by
B. L. Klock and D. K. Scott

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS



This Circular contains positions of the sun, moon, and planets observed with the Six-Inch Transit Circle between 8 August, 1969 and 31 December, 1970. These results are provisional. Definitive results will be published later in a volume of Publications of the U.S. Naval Observatory.

These results are a continuation of those published in U. S. Naval Observatory Circular No. 127.

The observed positions are geocentric and have received the usual corrections for instrumental errors, refraction, diurnal aberration, parallax, and orbital motion. The right ascensions were reduced, differentially, to the FK4 system by means of the FK4 stars used to determine the clock correction. All positions are for the center of the object.

The declinations of the night objects have been reduced to the FK4 system by applying a correction derived from the same stars that were used for the clock correction.

The sun, Mercury, and Venus were reduced with the clock correction of the nearest night tour and the nadirs taken at the time of the observation. Corrections for day minus night differences are not available at this time.

Observations of Mercury and Venus were made on the illuminated limb or on the center of light as indicated, and reduced with the appropriate corrections to the center of the planet. Observations of the sun, Mars, Jupiter, and Saturn were made on both pairs of limbs; those of Mars and Jupiter have been corrected for defective illumination. The tabular semidiameters from the ephemeris have been used whenever a correction from limb to center or a correction for defective illumination has been applied. The moon observations were made on the illuminated limbs as indicated and have been reduced with the tabular values of the semidiameter corrected for irradiation (Pub. U.S. Naval Observatory, XVI, 378) and with limb corrections from the charts of C. B. Watts (Astro. Papers, Vol. 17).

The computed positions with which the observed positions are compared were derived from the tabular values of the American Ephemeris for the instant when the ephemeris hour angle is zero on the meridian $5^{\text{h}} 15^{\text{s}} 849$ west longitude. No correction has been made for the difference between Ephemeris and Universal Time. The Julian Ephemeris Dates refer to the computed times of transit. The distance, in astronomical units, are those interpolated from the American Ephemeris at the computed time of transit. Brown's lunation numbers have been indicated for the moon. The lunar ephemeris has received differential corrections so that it is on the system $j=2$ (Trans. International Astronomical Union, Vol. XIII, 49). The correction for parallax in declination for the moon have been made using the IAU dimensions of the earth.

The observers are identified as follows:

A, D.A. Collins; B, R.L. Branham; C, H.E. Crull; D, H.E. Durgin; E, F.J. Giovane; F, R.W. Goebel; G, F.S. Gauss; H, E.R. Holdenried; I, M.R. Kuzio; J, E.S. Jackson; K, B.L. Klock; L, D.G. Hough; M, J.A. Hughes; P, E.J. Coyne; Q, D.W. Rivers; R, R.W. Rhynsburger; S, C.A. Smith, Jr.; T, M.D. Robinson; W, P.A. Jones; X, F.X. Ferrara; Y, T.E. Corbin; Z, J.J. Zimmerman.

The values of ΔT from the moon observations (lunation means) are listed in Table 1. The mean value of ΔT is $38^{\text{s}} 67 (\pm 11)$ for 1969 and $39^{\text{s}} 54 (\pm 17)$ for 1970. ΔT is computed by dividing $(O-C)$ by 1.002738 times the variation per hour of longitude. The weights in right ascension are proportional to the square of $15 \cos \delta$ times the variation in right ascension per hour of longitude; those in declination are proportional to the square of the variation in declination per hour of longitude.

TABLE 1

Lun.	ΔT	P.E.	Lun.	ΔT	P.E.
576	$38^{\text{s}} 83$	$0^{\text{s}} 60$	585	$40^{\text{s}} 09$	$0^{\text{s}} 28$
577	38.42	0.24	586	39.28	0.30
578	38.66	0.23	587	39.28	0.32
579	38.22	0.37	588	39.34	0.89
580	39.03	0.27	589	37.80	0.48
581	38.28	0.15	590	39.04	0.21
582	37.87	0.45	591	40.43	0.16
583	39.15	0.26	592	40.01	0.25
584	41.04	0.27	593	39.23	0.32

SUN											
Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance	
244			h m s	s			° ' "	° ' "			
69 08 06.71	0440.21809	G	9 06	02.136	+0.49		+16 37	08.89	-1.59	1.014145	
69 08 07.71	0441.21800	C	9 09	51.703	+1.13		+16 20			1.013997	
69 08 08.71	0442.21792	A	9 13	40.664	+1.36		+16 03	25.32	-1.74	1.013846	
69 08 10.71	0444.21772	R	9 21				+15 28	40.78	-0.68	1.013527	
69 08 11.71	0445.21761	Q	9 25	03.919	+0.19		+15 10			1.013359	
69 08 16.71	0450.21698	G	9 43				+13 38	37.25	+0.11	1.012448	
69 08 20.71	0454.21636	E	9 58	44.450	+1.30		+12 20	50.07	-1.14	1.011636	
69 08 21.71	0455.21619	R	10 02	26.294	+0.59		+12 00	53.78	-1.07	1.011424	
69 08 22.71	0456.21602	L	10 06	07.779	+1.07		+11 40			1.011209	
69 08 23.71	0457.21584	R	10 09	48.693	+0.52		+11 20	27.18	-1.60	1.010990	
69 08 24.71	0458.21565	R	10 13	29.296	+1.33		+10 59	57.88	-1.70	1.010770	
69 08 25.71	0459.21546	K	10 17	09.355	+0.95		+10 39	19.53	-0.56	1.010548	
69 08 26.71	0460.21527	L	10 20	49.035	+1.00		+10 18	29.41	-1.14	1.010323	
69 08 27.71	0461.21507	A	10 24	28.283	+0.74		+ 9 57	30.38	-0.93	1.010097	
69 08 31.71	0465.21423	L	10 39	01.900	+1.28		+ 8 32	01.77	-0.56	1.009181	
69 09 01.71	0466.21401	A	10 42	39.484	+1.00		+ 8 10	18.22	-0.32	1.008947	
69 09 07.71	0472.21264	L	11 04	20.057	+1.97		+ 5 57	18.69	-0.18	1.007493	
69 09 11.71	0476.21168	K	11 18	43.105	+0.20		+ 4 26	32.56	-1.71	1.006464	
69 09 12.71	0477.21144	A	11 22	18.606	+0.33		+ 4 03	40.41	-0.26	1.006199	
69 09 13.71	0478.21119	L	11 25	54.078	+1.15		+ 3 40			1.005931	
69 09 14.71	0479.21095	L	11 29	29.361	+0.73		+ 3 17	41.33	+0.35	1.005659	
69 09 23.70	0488.20874	R	12 01	46.743	+0.60		- 0 11	33.62	+0.38	1.003126	
69 09 26.70	0491.20801	W	12 12	33.923	+0.70		- 1 21			1.002274	
69 09 27.70	0492.20778	R	12 16	09.995	+0.62		- 1 45	01.72	+0.26	1.001991	
69 09 28.70	0493.20754	L	12 19				- 2 08	24.10	-1.04	1.001708	
69 09 29.70	0494.20731	K	12 23	22.853	+0.58		- 2 31	43.78	-0.71	1.001427	
69 09 30.70	0495.20709	R	12 26	59.697	+0.84		- 2 55	02.29	-0.48	1.001146	
69 10 04.70	0499.20621	R	12 41	30.143	+1.42		- 4 27	57.05	-0.59	1.000023	
69 10 06.70	0501.20580	R	12 48	47.434	+1.01		- 5 14	06.18	+0.40	0.999458	
69 10 10.70	0505.20503	A	13 03	27.112	+1.01		- 6 45	36.54	+0.52	0.998323	
69 10 11.70	0506.20485	R	13 07	08.244	+1.58		- 7 08	16.95	+0.24	0.998037	
69 10 12.70	0507.20468	R	13 10	49.770	+1.19		- 7 30	51.19	+0.28	0.997750	
69 10 18.70	0513.20377	R	13 33	10.384	+1.18		- 9 43	52.32	+0.04	0.996020	
69 10 19.70	0514.20364	L	13 36	55.802	+1.05		-10 05	34.42	+0.20	0.995734	
69 10 20.70	0515.20352	K	13 40	41.879	+1.35		-10 27	08.01	-0.03	0.995449	
69 10 21.70	0516.20341	L	13 44	28.498	+0.78		-10 48	30.86	+1.07	0.995166	
69 10 23.70	0518.20320	C	13 52	03.769	+0.35		-11 30			0.994609	
69 10 24.70	0519.20311	A	13 55	52.492	+0.75		-11 51	42.98	+0.87	0.994334	
69 10 27.70	0522.20289	D	14 07	22.920	+1.30		-12 53	19.51	-1.16	0.993528	
69 10 28.70	0523.20283	A	14 11	14.527	+1.19		-13 13			0.993266	
69 10 30.70	0525.20274	L	14 19	00.111	+1.28		-13 53	04.75	+0.77	0.992749	
69 11 15.70	0541.20342	R	15 23	04.087	+0.92		-18 34	05.36	+0.65	0.988920	
69 11 16.70	0542.20355	L	15 27	11.479	+0.93		-18 49			0.988698	
69 11 17.70	0543.20368	C	15 31	19.706	+1.18		-19 03	50.67	+1.36	0.988479	
69 11 18.70	0544.20383	L	15 35	28.761	+1.49		-19 18	13.26	+1.16	0.988264	
69 11 21.70	0547.20432	A	15 48	00.701	+1.86		-19 59	15.61	-0.64	0.987644	
69 11 22.70	0548.20450	R	15 52	12.930	+1.81		-20 12	10.10	+1.65	0.987447	
69 11 23.70	0549.20469	L	15 56	25.946	+1.79		-20 24	46.44	-0.14	0.987256	
69 11 24.70	0550.20489	C	16 00	39.697	+1.29		-20 36	58.76	-0.39	0.987068	
69 11 25.70	0551.20509	W	16 04				-20 48	46.76	+0.71	0.986886	
69 11 26.70	0552.20531	A	16 09	09.626	+1.62		-21 00	13.29	+0.01	0.986710	
69 11 27.70	0553.20554	L	16 13	25.674	+1.39		-21 11	14.59	+1.06	0.986539	
69 11 28.70	0554.20577	C	16 17	42.423	+0.89		-21 21	52.97	+1.12	0.986372	
69 11 29.70	0555.20601	L	16 21	59.968	+1.19		-21 32	06.23	+2.10	0.986211	
69 11 30.70	0556.20626	L	16 26	18.146	+0.82		-21 41	57.32	+0.71	0.986054	

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 5

SUN

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s		s		°	"	"	
69 12 02.70	0558.20678	A	16 34	56.656	+ .161	-22 00	21.63	+1.12		0.985754
69 12 04.70	0560.20734	A	16 43	37.572	+ .096	-22 17	05.14	+0.78		0.985470
69 12 05.70	0561.20762	L	16 47	58.935	+ .066	-22 24	48.07	+0.59		0.985334
69 12 13.71	0569.21012	R	17 23	07.762	+ .114	-23 10	28.16	+1.35		0.984364
69 12 17.71	0573.21146	A	17 40	50.282	+ .130	-23 22	18.18	+1.99		0.983969
69 12 18.71	0574.21180	L	17 45	16.303	+ .044	-23 24				0.983883
69 12 20.71	0576.21249	L	17 54	08.961	+ .123	-23 26	16.66	+1.73		0.983727
69 12 24.71	0580.21387	L	18 11	54.720	+ .137	-23 24	59.92	+1.38		0.983491
70 01 02.71	0589.21690	A	18 51	46.227	+ .032	-22 54	43.08	+0.59		0.983310
70 01 05.71	0592.21785	A	19 04	58.619	+ .106	-22 36	17.29	+2.26		0.983340
70 01 30.72	0617.22334	W	20 51	27.854	- .025	-17 38	00.69	+1.04		0.985204
70 02 04.72	0622.22378	L	21 11	48.923	+ .110	-16 11	44.39	+1.96		0.985961
70 02 07.72	0625.22393	L	21 23	51.780	+ .099	-15 16	34.47	+1.36		0.986451
70 02 12.72	0630.22400	L	21 43	40.490	+ .140	-13 39	33.69	+0.28		0.987324
70 02 18.72	0636.22379	D	22 07	01.436	+ .047	-11 35	50.25	+1.92		0.988494
70 02 19.72	0637.22373	L	22 10	52.445	+ .073	-11 14	34.26	+0.52		0.988705
70 02 22.72	0640.22349	L	22 22	21.442	+ .118	-10 09	40.29	+1.15		0.989362
70 02 23.72	0641.22339	L	22 26	09.694	- .007	- 9 47	43.62	+0.90		0.989591
70 02 26.72	0644.22307	C	22 37	31.381	+ .081	- 8 41				0.990300
70 02 27.72	0645.22295	A	22 41	17.431	+ .042	- 8 18	29.15	+1.58		0.990544
70 02 28.72	0646.22282	L	22 45	03.007	+ .063	- 7 55	52.41	+0.39		0.990791
70 03 01.72	0647.22269	L	22 48	48.147	+ .141	- 7 33				0.991040
70 03 02.72	0648.22255	L	22 52	32.685	+ .105	- 7 10	14.96	+1.09		0.991293
70 03 08.72	0654.22161	L	23 14	50.772	+ .145	- 4 51	08.97	+0.53		0.992836
70 03 11.72	0657.22108	D	23 25	54.400	+ .069	- 3 40	39.45	+0.58		0.993618
70 03 14.72	0660.22052	L	23 36			- 2 29	47.17	+0.54		0.994409
70 03 16.72	0662.22012	D	23 44	14.275	+ .031	- 1 42	23.64	+1.66		0.994944
70 03 17.71	0663.21992	L	23 47	53.532	+ .065	- 1 18	41.79	+1.13		0.995214
70 03 27.71	0673.21784	L	0 24	18.137	+ .033	+ 2 37	41.44	+1.24		0.998031
70 03 28.71	0674.21763	L	0 27	56.432	+ .095	+ 3 01	09.47	+2.26		0.998323
70 04 03.71	0680.21638	W	0 49	47.453	+ .013	+ 5 20	25.68	+0.04		1.000081
70 04 05.71	0682.21597	L	0 57	05.621	+ .069	+ 6 06	11.91	+0.80		1.000660
70 04 08.71	0685.21538	P	1 08	04.237	+ .068	+ 7 14				1.001515
70 04 11.71	0688.21482	L	1 19	04.958	+ .078	+ 8 20	44.57	+0.64		1.002355
70 04 18.71	0695.21362	L	1 44	56.972	+ .071	+10 51	11.58	-0.31		1.004280
70 04 21.71	0698.21317	R	1 56	07.668	+ .125	+11 53	06.20	+0.37		1.005098
70 04 22.71	0699.21303	P	1 59	52.061	+ .119	+12 13	22.26	+1.38		1.005370
70 04 25.71	0702.21264	L	2 11	08.035	+ .068	+13 12	52.45	-0.44		1.006184
70 04 30.71	0707.21211	H	2 30			+14 47	43.91	-0.06		1.007518
70 05 01.71	0708.21202	H	2 33	53.902	+ .127	+15 05	59.55	-0.30		1.007777
70 05 02.71	0709.21194	L	2 37	43.393	+ .089	+15 24	00.37	-0.44		1.008034
70 05 05.71	0712.21174	H	2 49	15.292	+ .012	+16 16	31.06	+0.19		1.008780
70 05 09.71	0716.21156	R	3 04	45.882	+ .081	+17 22	41.77	-0.53		1.009720
70 05 11.71	0718.21150	P	3 12	34.460	+ .022	+17 54	04.15	-0.18		1.010168
70 05 12.71	0719.21149	D	3 16	29.576	- .008	+18 09	18.24	-0.08		1.010386
70 05 14.71	0721.21147	H	3 24	21.648	+ .104	+18 38	50.99	+0.10		1.010813
70 05 18.71	0725.21152	H	3 40	12.224	+ .132	+19 34	05.96	-0.76		1.011635
70 05 19.71	0726.21155	R	3 44	11.174	+ .074	+19 47	05.81	-0.64		1.011835
70 05 20.71	0727.21159	C	3 48	10.719	+ .066	+19 59				1.012032
70 05 21.71	0728.21163	W	3 52	10.760	+ .005	+20 12	04.90	-0.19		1.012227
70 05 22.71	0729.21168	D	3 56	11.452	+ .059	+20 24	02.82	-0.72		1.012421
70 05 23.71	0730.21173	L	4 00	12.561	- .011	+20 35	40.80	-0.32		1.012611
70 05 24.71	0731.21179	R	4 04	14.411	+ .142	+20 46	57.54	-0.14		1.012800
70 05 29.71	0736.21217	L	4 24	30.443	+ .051	+21 37	55.62	+0.25		1.013696
70 05 30.71	0737.21227	R	4 28	35.120	+ .056	+21 46	59.58	-0.66		1.013862

SUN

Date	J.E.D.	O L	Obs. R.A.	(O-C)	L	Obs. Decl.	(O-C)	Distance
	244		h m s	s		° ' "	"	
70 05 31.71	0738.21237	L	4 32 40.212	+0.029		+21 55 42.24	-0.20	1.014024
70 06 03.71	0741.21269	R	4 44 58.092	+0.023		+22 19 30.01	-0.99	1.014479
70 06 10.71	0748.21359	D	5 13 51.655	+0.080		+23 01 17.16	-0.33	1.015350
70 06 11.71	0749.21373	L	5 18 00.333	+0.108		+23 05 38.03	-1.01	1.015455
70 06 12.71	0750.21387	P	5 22 09.176	+0.123		+23 09 35.54	-0.62	1.015554
70 06 13.71	0751.21401	R	5 26 18.156	+0.103		+23 13 08.58	-0.23	1.015650
70 06 14.71	0752.21416	L	5 30 27.355	+0.169		+23 16 16.80	-0.07	1.015741
70 06 17.71	0755.21460	C	5 42 55.394	+0.146		+23 23 13.44	+0.26	1.015992
70 06 18.71	0756.21475	D	5 47 04.779	+0.034		+23 24 42.18	-0.36	1.016069
70 06 20.71	0758.21505	L	5 55 23.922	+0.072		+23 26 26.94	-0.20	1.016213
70 06 23.71	0761.21550	H	6 07 52.544	+0.087		+23 25 57.49	-0.91	1.016405
70 06 24.71	0762.21565	Q	6 12 01.937	+0.033		+23 24 58.86	-0.39	1.016462
70 06 25.71	0763.21579	W	6 16 11.348	+0.080		+23 23 35.03	-0.32	1.016514
70 06 27.71	0765.21609	L	6 24 29.797	+0.123		+23 19 32.12	-1.22	1.016606
70 06 28.71	0766.21623	L	6 28 38.812	+0.139		+23 16 54.03	-1.29	1.016643
70 07 02.71	0770.21678	C	6 45 12.767	+0.080		+23 02 17.62	-0.90	1.016737
70 07 03.71	0771.21691	W	6 49 20.622	+0.059		+22 57 37.77	-0.83	1.016746
70 07 04.71	0772.21704	L	6 53 28.313	+0.170		+22 52 33.97	-0.67	1.016748
70 07 15.71	0783.21814	L	7 38 25.419	+0.075		+21 31		1.016411
70 07 16.71	0784.21820	D	7 42 27.877	+0.156		+21 21		1.016353
70 07 17.71	0785.21827	P	7 46 29.617	+0.045		+21 11		1.016292
70 07 18.71	0786.21832	R	7 50 31.038	+0.142		+21 01		1.016228
70 07 19.71	0787.21837	R	7 54 31.793	+0.119		+20 50		1.016160
70 07 25.71	0793.21853	R	8 18 24.746	+0.055		+19 38 40.73	-0.76	1.015684
70 07 27.71	0795.21853	D	8 26 17.851	+0.005		+19 12 07.15	-1.34	1.015491
70 07 28.71	0796.21852	F	8 30 13.559	+0.008		+18 58 22.72	-0.41	1.015387
70 07 30.71	0798.21848	H	8 38 03.217	+0.033		+18 29 55.89	-0.39	1.015164
70 08 01.71	0800.21841	R	8 45 50.483	+0.074		+18 00 15.63	-0.78	1.014918
70 08 02.71	0801.21836	F	8 49 43.118	+0.007		+17 44		1.014788
70 08 05.71	0804.21819	G	9 01 17.582	+0.046		+16 57 26.81	-0.64	1.014362
70 08 11.71	0810.21765	H	9 24 10.106	+0.122		+15 15 06.95	-1.36	1.013379
70 08 12.71	0811.21753	P	9 27 56.841	+0.181		+14 57 11.47	-1.02	1.013202
70 08 13.71	0812.21741	I	9 31			+14 39 01.56	-0.99	1.013021
70 08 14.71	0813.21729	W	9 35 28.424	+0.140		+14 20 37.18	-1.52	1.012837
70 08 16.71	0815.21701	F	9 42 57.833	+0.138		+13 43 09.87	-0.73	1.012462
70 08 18.71	0817.21671	Q	9 50			+13 04 48.63	-1.81	1.012079
70 08 20.71	0819.21639	W	9 57 50.396	+0.073		+12 25 38.81	-1.59	1.011687
70 08 21.71	0820.21623	I	10 01 32.357	+0.065		+12 05 45.37	-1.97	1.011488
70 08 22.71	0821.21605	R	10 05 13.968	+0.151		+11 45 41.88	-0.82	1.011287
70 08 25.71	0824.21550	G	10 16 15.927	+0.063		+10 44 21.33	-0.83	1.010662
70 08 29.71	0828.21471	F	10 30			+ 9 20 12.04	+0.04	1.009778
70 08 31.71	0830.21428	P	10 38 09.800	+0.110		+ 8 37 11.00	-0.73	1.009313
70 09 01.71	0831.21407	G	10 41 47.500	+0.020		+ 8 15 27.49	-1.62	1.009074
70 09 05.71	0835.21317	F	10 56 15.903	+0.133		+ 6 47 21.94	-0.45	1.008081
70 09 06.71	0836.21294	I	10 59 52.243	+0.027		+ 6 25 02.40	-0.95	1.007824
70 09 08.71	0838.21246	H	11 07 04.526	+0.079		+ 5 40 05.82	-1.21	1.007302
70 09 09.71	0839.21223	G	11 10 40.352	+0.081		+ 5 17 29.71	-0.74	1.007037
70 09 11.71	0841.21174	L	11 17 51.498	+0.058		+ 4 32 01.04	-0.78	1.006503
70 09 12.71	0842.21150	F	11 21 26.882	+0.070		+ 4 09 08.85	-1.68	1.006235
70 09 13.71	0843.21125	I	11 25 02.091	+0.015		+ 3 46 15.11	+0.17	1.005965
70 09 15.71	0845.21076	F	11 32 12.428	+0.066		+ 3 00		1.005425
70 09 16.71	0846.21051	H	11 35 47.489	+0.051		+ 2 37		1.005155
70 09 19.70	0849.20977	R	11 46 32.778	+0.068		+ 1 27 27.51	-0.61	1.004344
70 09 20.70	0850.20952	F	11 50 07.985	+0.091		+ 1 04 10.87	+0.10	1.004072
70 09 21.70	0851.20927	D	11 53 43.203	+0.041		+ 0 40 51.92	+0.36	1.003800

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 7

SUN

Date	J.E.D.	O L	Obs. R.A.	(O-C)	L	Obs. Decl.	(O-C)	Distance
	244		h m s	s		° ' "	"	
70 09 22.70	0852.20903	R	11 57 18.661	+0.124		+ 0 17 30.15	-0.73	1.003527
70 09 24.70	0854.20854	P	12 04 29.732	+0.073		- 0 29 14.00	-0.43	1.002977
70 09 25.70	0855.20830	H	12 08 05.506	+0.058		- 0 52 37.40	-0.63	1.002699
70 09 26.70	0856.20807	I	12 11 41.503	+0.082		- 1 15 59.88	+0.13	1.002421
70 09 29.70	0859.20737	H	12 22 30.607	+0.026		- 2 26 08.68	-2.10	1.001574
70 10 01.70	0861.20692	G	12 29			- 3 12 44.48	+0.32	1.001000
70 10 02.70	0862.20670	W	12 33 22.043	+0.034		- 3 36 00.04	+0.85	1.000711
70 10 03.70	0863.20648	R	12 36 59.851	+0.113		- 3 59 15.01	-0.45	1.000420
70 10 04.70	0864.20627	F	12 40 37.846	+0.046		- 4 22 25.80	-0.40	1.000128
70 10 05.70	0865.20606	D	12 44 16.230	+0.027		- 4 45 32.01	+0.93	0.999835
70 10 06.70	0866.20585	W	12 47 55.071	+0.111		- 5 08 36.02	+0.78	0.999541
70 10 09.70	0869.20526	F	12 58 53.667	+0.112		- 6 17 22.12	+1.04	0.998658
70 10 12.70	0872.20472	H	13 09 56.058	+0.045		- 7 25 22.48	+0.96	0.997784
70 10 13.70	0873.20455	G	13 13 37.874	+0.078		- 7 47 51.41	+0.38	0.997496
70 10 17.70	0877.20393	I	13 28 30.425	+0.079		- 9 16 35.26	+1.57	0.996365
70 10 18.70	0878.20379	I	13 32 15.045	+0.094		- 9 38		0.996089
70 10 19.70	0879.20366	D	13 36 00.275	+0.084		-10 00 13.19	+0.40	0.995813
70 10 24.70	0884.20312	F	13 54			-11 46 38.47	-1.04	0.994460
70 10 25.70	0885.20304	F	13 58 45.801	+0.100		-12 07 24.22	-0.38	0.994194
70 10 26.70	0886.20296	G	14 02 35.817	+0.044		-12 28 00.28	-1.05	0.993928
70 11 08.70	0899.20281	F	14 53 37.539	+0.029		-16 35 41.39	-1.52	0.990562
70 11 16.70	0907.20350	P	15 26 10.582	+0.159		-18 45 25.96	+0.63	0.988727
70 11 21.70	0912.20426	R	15 46 58.761	+0.130		-19 55 58.89	+0.88	0.987721
70 11 22.70	0913.20444	I	15 51 10.811	+0.043		-20 09 01.81	+0.70	0.987530
70 12 02.70	0923.20672	H	16 33 54.328	+0.114		-21 58 13.96	+0.22	0.985795
70 12 04.70	0925.20727	D	16 42 35.108	+0.136		-22 15 09.63	-0.30	0.985483
70 12 05.70	0926.20756	F	16 46 56.190	-0.001		-22 22 55.07	+3.02	0.985334
70 12 09.70	0930.20875	I	17 04 26.180	+0.078		-22 49		0.984783
70 12 10.70	0931.20907	H	17 08 49.784	+0.062		-22 55 24.55	+0.45	0.984659
70 12 14.71	0935.21036	D	17 26 28.149	+0.166		-23 13		0.984222
70 12 15.71	0936.21069	F	17 30 53.408	+0.055		-23 16 33.23	+0.89	0.984128
70 12 18.71	0939.21171	D	17 44 11.064	+0.129		-23 23 40.80	+1.75	0.983881
70 12 26.71	0947.21447	R	18 19 43.077	+0.148		-23 22 03.13	+0.44	0.983445
70 12 27.71	0948.21482	R	18 24 09.453	+0.116		-23 19 43.06	+0.83	0.983410
70 12 28.71	0949.21516	D	18 28 35.676	+0.085		-23 16 53.88	+2.16	0.983378
70 12 29.71	0950.21550	G	18 33 01.783	+0.132		-23 13 39.49	+0.64	0.983350
70 12 30.71	0951.21584	R	18 37 27.588	+0.096		-23 09 54.61	+1.66	0.983325

MERCURY

69 08 06.76	0440.26062	G	C 10 07 27.511	+0.054	C +12 59 34.18	-2.20	1.281531
69 08 13.77	0447.27150	R	C 10 50 46.215	+0.134	C + 8 00 10.23	-1.71	1.211992
69 08 21.77	0455.27888	R	C 11 32 57.829	+0.071	C + 2 22 51.55	-1.49	1.116081
69 08 23.77	0457.27996	R	C 11 42 24.371	+0.101	C + 1 02 12.25	-1.50	1.089944
69 10 09.66	0504.16462	R	12 01		C + 0 41 20.67	+1.00	0.826296
69 10 10.66	0505.16293	A	C 12 02 39.542	+0.066	C + 0 46 58.58	+0.71	0.852723
69 10 18.66	0513.16125	R	C 12 31 46.764	+0.140	C - 1 15 16.92	-0.89	1.073334
69 10 19.66	0514.16207	L	C 12 36 54.109	+0.113	C - 1 46 06.59	-1.09	1.099056
69 10 20.66	0515.16302	K	C 12 42 13.291	+0.137	C - 2 19 08.09	-1.33	1.123914
69 10 21.66	0516.16409	L	C 12 47 42.370	+0.124	C - 2 54 00.12	-0.39	1.147840
69 10 28.67	0523.17349	A	C 13 28 52.952	+0.197	C - 7 27 43.96	-1.37	1.286871
69 10 29.67	0524.17499	W	C 13 34 59.031	+0.093	C - 8 08 34.30	-0.94	1.302673
69 10 30.67	0525.17650	L	C 13 41 07.006	+0.191	C - 8 49 22.57	+0.12	1.317512
69 11 25.72	0551.22007	W	C 16 26 31.497	+0.127	C -22 55 31.72	-1.21	1.439512
69 12 02.73	0558.23351	A	C 17 13 32.422	+0.082	C -24 48 41.03	-1.59	1.401993

MERCURY

Date	J.E.D.	O	L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244			h	m	s		°	'	"	
69 12 04.73	0560.23748	A	C	17	27	08.915	+0.086	C -25 09	30.07	-1.51	1.385951
69 12 20.76	0576.26762	L	C	19	13	45.361	+0.100	C -24 29	48.71	-1.33	1.158989
70 03 11.69	0657.19596	D	C	22	49	38.295	+0.211	C -9 47	57.93	-0.14	1.349307
70 03 17.70	0663.20761	L	C	23	30	06.555	+0.055	C -5 16	28.46	+0.58	1.361517
70 03 28.73	0674.23178	L	C	0	48	22.749	+0.153	C +4 35	01.51	+1.83	1.306230
70 04 03.74	0680.24566	W	C	1	32	04.821	+0.104	C +10 11	56.93	+1.57	1.215075
70 04 05.74	0682.24999	L	C	1	46	13.128	+0.160	C +11 57	25.66	+1.41	1.174538
70 04 08.75	0685.25582	P	C	2	06	27.609	+0.096	C +14 23	09.52	+1.38	1.106208
70 04 11.76	0688.26048	L	C	2	25	00.959	+0.107	C +16 29	29.22	+1.47	1.031855
70 04 18.76	0695.26480	L	C	2	58	51.293	+0.027	C +19 52	24.57	+0.10	0.855551
70 06 20.66	0758.16255	L	C	4	39	35.371	+0.239	C +20 45	11.65	-0.37	1.123187
70 07 17.75	0785.25428	P	C	8	38	29.862	+0.074	+20 20			1.288733
70 07 18.75	0786.25698	R	C	8	46	20.750	+0.106	+19 48			1.279888
70 08 02.78	0801.28324	F	C	10	23	23.284	+0.003	C +10 26	35.40	-1.70	1.102416
70 10 01.66	0861.16455	G		11	28			C +5 06	16.14	-0.71	1.041415
70 10 03.66	0863.16643	R	C	11	39	10.033	+0.101	C +4 10	40.69	-1.20	1.095048
70 10 04.66	0864.16760	F	C	11	44	47.925	+0.194	C +3 38	42.42	-0.87	1.120668
70 10 05.66	0865.16888	D		11	50			C +3 04	22.93	+0.34	1.145353
70 10 06.67	0866.17027	W	C	11	56	32.303	+0.098	C +2 27	57.89	-0.27	1.169026
70 10 12.67	0872.17968	H	C	12	33	47.040	+0.276	C -1 38	58.75	-0.76	1.287982
70 10 17.68	0877.18791	I	C	13	05	22.990	+0.107	C -5 20	01.95	-1.27	1.357484
70 11 08.72	0899.22297	F	C	15	22	44.188	+0.082	C -19 24	18.37	-0.73	1.429725
70 11 16.73	0907.23638	P	C	16	13	38.456	+0.162	C -22 49	57.53	-1.09	1.384341
70 12 15.77	0936.27063	F	C	18	57	26.542	+0.102	C -24 04	01.72	+0.33	0.891558

VENUS

69 08 06.60	0440.10068	G	2	6	16	30.806	+0.183	N +21 44	06.91	-0.50	1.087820
69 08 13.60	0447.10557	R	2	6	51	10.478	+0.218	S +21 39	11.15	-1.02	1.136831
69 08 21.61	0455.11135	R	2	7	31	03.699	+0.189	S +20 58	48.62	-1.02	1.190782
69 08 22.61	0456.11208	L	2	7	36	03.035	+0.263	S +20 51	07.89	-1.47	1.197369
69 08 23.61	0457.11280	R	2	7	41	02.110	+0.193	S +20 42	52.95	-1.39	1.203921
69 08 24.61	0458.11352	R	2	7	46	01.097	+0.194	S +20 34	03.08	-1.59	1.210438
69 09 01.61	0466.11917	A	2	8	25	42.989	+0.245	S +19 03	00.00	-1.59	1.261268
69 09 07.62	0472.12320	L	2	8	55	11.155	+0.189	+17 31			1.297766
69 09 11.62	0476.12575	K		9	14			S +16 20	54.47	-2.16	1.321278
69 09 12.62	0477.12636	A	2	9	19	28.333	+0.180	S +16 02	00.01	-1.45	1.327051
69 09 14.62	0479.12758	L	2	9	29	06.587	+0.201	S +15 22	49.00	+0.15	1.338471
69 09 22.63	0487.13211	W	2	10	07	12.129	+0.142	S +12 29	04.26	-1.78	1.382484
69 09 23.63	0488.13265	R	2	10	11	54.865	+0.188	S +12 05	37.85	-1.19	1.387799
69 09 28.63	0493.13520	L	2	10	35	19.102	+0.127	S +10 03	17.09	-1.50	1.413754
69 09 29.63	0494.13570	K	2	10	39	58.358	+0.219	S +9 37	51.62	-2.17	1.418818
69 10 04.63	0499.13807	R	2	11	03	06.829	+0.208	S +7 26	41.08	-1.58	1.443485
69 10 06.63	0501.13899	R	2	11	12	19.192	+0.185	S +6 32	30.51	-1.16	1.453041
69 10 09.64	0504.14033	R	2	11	26	05.169	+0.191	S +5 09	40.27	-2.58	1.467037
69 10 10.64	0505.14077	A	2	11	30	39.942	+0.216	S +4 41	42.64	-2.09	1.471612
69 10 12.64	0507.14164	R	2	11	39	48.714	+0.191	S +3 45	19.85	-0.38	1.480625
69 10 18.64	0513.14423	R	2	12	07	11.960	+0.260	S +0 53	08.74	-2.79	1.506581
69 10 19.64	0514.14466	L	2	12	11	45.579	+0.141	S +0 24	11.36	-0.82	1.510753
69 10 20.64	0515.14509	K	2	12	16	19.420	+0.183	S -0 04	51.99	-1.67	1.514880
69 10 21.64	0516.14552	L	2	12	20	53.292	+0.160	S -0 33	56.46	-1.20	1.518964
69 10 22.64	0517.14595	C	2	12	25	27.332	+0.170	-1 03			1.523005
69 10 24.64	0519.14682	A	2	12	34	35.976	+0.166	-2 01			1.530958
69 10 27.64	0522.14815	D	2	12	48	20.953	+0.113	S -3 28	39.30	-1.71	1.542562
69 10 28.64	0523.14860	A	2	12	52	56.777	+0.216	S -3 57	40.46	-0.48	1.546343
69 10 30.64	0525.14952	L	2	13	02	09.566	+0.282	S -4 55	35.41	-1.40	1.553774
69 11 15.65	0541.15796	R	2	14	17	25.316	+0.233	S -12 18	23.47	-1.41	1.606767

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 9

VENUS

Date	J.E.D.	O	L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244			h m s	s			° ' "	"		
69 11 16.65	0542.15857	L	2	14 22	14.729	+1.43	S	-12 44	07.67	-0.23	1.609700
69 11 18.65	0544.15983	L	2	14 31	56.787	+1.23	S	-13 34	41.57	+0.67	1.615437
69 11 20.66	0546.16114	D	2	14 41	43.202	+1.81	S	-14 23	58.66	-1.35	1.621003
69 11 21.66	0547.16181	A	2	14 46	38.101	+2.32	S	-14 48	04.01	-1.07	1.623724
69 11 22.66	0548.16249	R	2	14 51	34.065	+2.17	S	-15 11	46.56	-0.32	1.626403
69 11 23.66	0549.16319	R	2	14 56	31.140	+1.59	S	-15 35	06.48	-0.01	1.629041
69 11 24.66	0550.16391	C	2	15 01	29.466	+1.69	S	-15 58	03.32	-0.48	1.631637
69 11 25.66	0551.16463	W	2	15 06	29.030	+2.40	S	-16 20	35.77	-1.27	1.634191
69 11 26.66	0552.16537	A	2	15 11	29.685	+2.06	S	-16 42	41.78	-1.04	1.636702
69 11 28.66	0554.16690	C	2	15 21	34.602	+1.26		-17 25			1.641602
69 12 02.67	0558.17011	A	2	15 41	59.346	+2.90	S	-18 45	40.13	-0.81	1.650897
69 12 04.67	0560.17180	A	2	15 52	18.780	+1.76	S	-19 22	41.08	-1.43	1.655291
69 12 17.68	0573.18403	A	2	17 01	13.566	+1.05	S	-22 26	28.38	-0.04	1.679705
69 12 20.68	0576.18710	L	2	17 17	29.717	+1.16	S	-22 53	27.45	-0.13	1.684352
69 12 24.69	0580.19131	L	2	17 39	19.981	+0.46	S	-23 19	41.35	-0.45	1.690000
70 02 07.73	0625.23429	L	1	21 38	49.530	+2.25	N	-15 30	09.94	+0.34	1.709933
70 02 12.73	0630.23759	L	1	22 03	18.103	+1.33	S	-13 26	45.72	-0.70	1.707130
70 02 18.74	0636.24113	D	1	22 32	03.319	+0.59	S	-10 46	49.98	+0.37	1.702391
70 02 23.74	0641.24376	L	1	22 55	33.991	+0.12	S	- 8 25	37.35	+0.57	1.697299
70 02 27.74	0645.24569	A		23 14			S	- 6 28	34.99	+0.83	1.692467
70 02 28.74	0646.24616	L	1	23 18	44.886	+1.18	S	- 5 58	52.69	-0.09	1.691151
70 03 08.74	0654.24966	L	1	23 55	20.855	+0.52	S	- 1 56	25.85	-0.57	1.678996
70 03 11.75	0657.25091	D	1	0 08	58.531	+0.07	S	- 0 24	11.27	-0.18	1.673664
70 03 17.75	0663.25337	L	1	0 36	10.889	+0.94	S	+ 2 40	33.82	+2.16	1.661714
70 03 27.75	0673.25760	L	1	1 21	43.229	+0.45	S	+ 7 42	54.54	+0.45	1.637977
70 03 28.75	0674.25805	L	1	1 26	18.645	+0.59	S	+ 8 12	24.11	+0.84	1.635338
70 04 03.76	0680.26089	W	1	1 54	03.890	-0.35	S	+11 04	59.34	+0.25	1.618446
70 04 05.76	0682.26190	L	1	2 03	24.818	+0.28	S	+12 00	34.69	+0.64	1.612403
70 04 08.76	0685.26349	P	1	2 17	32.496	+1.33	S	+13 21	47.00	+1.09	1.602940
70 04 11.76	0688.26518	L	1	2 31	48.106	+0.63	S	+14 40	02.49	-0.45	1.592997
70 04 18.76	0695.26951	L	1	3 05	39.225	+0.72	S	+17 29	26.17	-1.12	1.567939
70 04 22.77	0699.27225	P	1	3 25	23.070	+1.52	S	+18 56	38.68	-1.09	1.552467
70 04 25.77	0702.27444	L	1	3 40	22.242	+0.94	S	+19 56	53.85	-0.79	1.540320
70 04 30.77	0707.27833	H	1	4 05	42.421	+1.91	S	+21 26	36.19	+0.67	1.519030
70 05 01.77	0708.27915	H	1	4 10	49.542	+2.13	S	+21 42	48.78	-0.44	1.514615
70 05 02.77	0709.27997	L	1	4 15	57.517	+0.96	S	+21 58	26.97	-0.18	1.510146
70 05 05.78	0712.28252	H		4 31			S	+22 41	40.86	-0.43	1.496417
70 05 11.78	0718.28785	P	1	5 02	49.081	+0.75	S	+23 50	52.08	-0.70	1.467513
70 05 12.78	0719.28877	D	1	5 08	04.903	-0.36	S	+24 00	04.81	+0.06	1.462510
70 05 18.79	0725.29437	H	1	5 39	49.657	+0.02	S	+24 40	44.21	-0.15	1.431415
70 05 19.79	0726.29532	R	1	5 45	08.098	-0.07	S	+24 45	02.30	-0.84	1.426057
70 05 21.79	0728.29721	W		5 55			S	+24 51	31.58	-0.67	1.415195
70 05 23.79	0730.29910	L	1	6 06	22.570	+0.38		+24 55			1.404142
70 05 27.80	0734.30287	P	1	6 27	35.155	+1.54	S	+24 53	46.38	-1.43	1.381471
70 05 29.80	0736.30473	L	1	6 38	09.286	+0.34	N	+24 48	49.25	-0.02	1.369856
70 05 30.80	0737.30565	L	1	6 43	25.676	+0.10	N	+24 45	15.59	-0.28	1.363979
70 05 31.80	0738.30657	L	1	6 48	41.553	+0.33	N	+24 40	59.51	-0.51	1.358056
70 06 03.80	0741.30927	R	1	7 04	25.213	+0.65	N	+24 23	59.52	-0.55	1.340009
70 06 07.81	0745.31274	L	1	7 25	11.824	-0.17	N	+23 51	42.21	-0.34	1.315312
70 06 10.81	0748.31521	D	1	7 40	36.347	+1.07	N	+23 20	28.02	-1.59	1.296324
70 06 11.81	0749.31601	L	1	7 45	42.185	+0.90	N	+23 08	46.36	-1.32	1.289910
70 06 12.81	0750.31680	P	1	7 50	46.887	+1.65	N	+22 56	26.01	-1.88	1.283453
70 06 13.81	0751.31757	R	1	7 55	50.158	+0.60	N	+22 43	30.19	-0.48	1.276956
70 06 14.81	0752.31833	L	1	8 00	52.254	+0.79		+22 29			1.270418
70 06 20.82	0758.32253	L	1	8 30	35.823	+0.75	N	+20 56	10.42	-1.35	1.230387

VENUS

Date	J.E.D.	O	L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244			h m s	s			° ' "	"		
70 06 21.82	0759.32317	L	1	8 35	27.913	-.037	N +20 38	35.68	-1.00		1.223588
70 06 23.82	0761.32441	L	1	8 45	07.926	+.052	N +20 01	50.64	-0.78		1.209888
70 06 25.82	0763.32557	W	1	8 54	41.760	+.003	N +19 23	02.45	-1.18		1.196054
70 06 28.82	0766.32718	L	1	9 08	51.169	+.015	N +18 21	13.12	-0.81		1.175059
70 07 03.82	0771.32952	R	1	9 31	56.368	+.102	N +16 29	13.96	-2.03		1.139431
70 07 16.83	0784.33357	R	1	10 29	03.028	+.033	+10 55				1.043444
70 07 17.83	0785.33377	P	1	10 33	16.798	+.102	+10 28				1.035889
70 07 18.83	0786.33395	R	1	10 37	29.119	+.041	+10 00				1.028313
70 07 21.83	0789.33441	P	1	10 49	58.605	+.096	N + 8 35	32.97	-0.46		1.005473
70 08 02.83	0801.33506	F	1	11 38	13.139	+.012	N + 2 42	36.33	-1.17		0.912660
70 08 21.83	0820.33290	I	1	12 50	00.982	-.015	N - 6 45	01.12	-0.51		0.762494
70 08 24.83	0823.33225	F	1	13 00	54.195	+.069	N - 8 11	48.26	-1.89		0.738688
70 08 25.83	0824.33202	G	1	13 04	30.321	+.099	N - 8 40	24.84	-2.46		0.730757
70 08 29.83	0828.33097	F	1	13 18	46.194	+.050	N -10 32	56.15	-0.78		0.699074
70 08 30.83	0829.33069	I	1	13 22	17.928	+.036	N -11 00	32.19	+0.63		0.691165
70 08 31.83	0830.33039	P	1	13 25	48.716	+.024	N -11 27	56.85	-0.16		0.683262
70 09 01.83	0831.33008	G	1	13 29	18.460	-.057	N -11 55	06.58	-0.13		0.675366
70 09 02.82	0832.32976	P	1	13 32	47.255	-.063	-12 22				0.667478
70 09 04.82	0834.32908	W	1	13 39	41.595	-.083	-13 15				0.651726
70 09 05.82	0835.32872	F	1	13 43	07.119	-.019	N -13 41	11.70	+0.21		0.643864
70 09 06.82	0836.32835	I	1	13 46	31.276	-.102	N -14 07	01.10	+0.74		0.636013
70 09 09.82	0839.32714	G	1	13 56	36.056	-.039	N -15 22	43.69	-1.48		0.612535
70 09 11.82	0841.32625	L	1	14 03	11.775	-.049	N -16 11	32.11	-0.24		0.596959
70 09 12.82	0842.32577	F	1	14 06	27.044	-.158	N -16 35	24.75	+0.74		0.589198
70 09 13.82	0843.32528	I	1	14 09	40.785	-.029	N -16 58	56.80	+0.88		0.581457
70 09 17.82	0847.32307	G	1	14 22	15.552	-.006	-18 29				0.550728
70 09 20.82	0850.32114	F	1	14 31	18.036	+.046	N -19 32	50.77	+0.87		0.527975
70 09 21.82	0851.32043	D	1	14 34	13.582	-.067	N -19 53	09.65	+1.27		0.520456
70 09 24.81	0854.31812	P	1	14 42	43.083	-.080	-20 51				0.498116
70 09 25.81	0855.31728	F	1	14 45	26.569	-.067	N -21 09	51.60	+2.19		0.490748
70 09 26.81	0856.31640	I	1	14 48	06.522	-.109	N -21 27	51.06	+1.48		0.483423
70 09 29.81	0859.31348	H	1	14 55	43.782	-.040	N -22 18	44.25	+0.07		0.461725
70 10 02.81	0862.31012	W	1	15 02	42.272	-.066	N -23 04	42.04	+0.33		0.440495
70 10 03.80	0863.30889	R	1	15 04	52.016	-.145	N -23 18	51.56	+0.72		0.433535
70 10 04.80	0864.30760	F	1	15 06	56.569	-.143	N -23 32	24.63	+1.21		0.426641
70 10 12.79	0872.29468	H	1	15 19	50.067	-.028	N -24 56	44.97	-2.37		0.374275
70 10 17.78	0877.28379	I		15 23			N -25 23	53.79	+0.85		0.344846
70 10 19.77	0879.27873	D	1	15 24	23.764	-.059	N -25 28	16.49	+1.99		0.333998
70 11 08.70	0899.20633	F	1	14 58	42.513	-.120	N -21 56	08.70	+1.63		0.269261
70 11 16.67	0907.17289	P	2	14 41	57.695	-.124	-18 45				0.273045
70 11 21.65	0912.15404	R	2	14 34	27.628	+.005	S -16 49	59.51	+0.06		0.284578
70 11 22.65	0913.15055	I	2	14 33	22.160	-.099	-16 28				0.287651
70 12 02.62	0923.12152	H		14 30			S -13 54	55.01	+1.90		0.330001
70 12 04.61	0925.11695	D	2	14 32	09.518	+.136	S -13 37	41.06	-1.07		0.340575
70 12 05.61	0926.11480	F	2	14 33	00.359	-.023	S -13 30	41.20	+0.41		0.346076
70 12 09.60	0930.10714	I	2	14 37	42.419	+.041	S -13 13	21.83	+1.14		0.369348
70 12 10.60	0931.10543	H	2	14 39	11.338	.000	S -13 11	33.72	-0.28		0.375453
70 12 15.59	0936.09807	F	2	14 48	16.493	+.076	S -13 15	45.41	-0.44		0.407409
70 12 18.59	0939.09450	D	2	14 54	56.524	+.187	-13 27				0.427544
70 12 26.58	0947.08755	R	2	15 16	26.728	+.129	S -14 24	30.22	-1.18		0.483779
70 12 27.58	0948.08691	R	2	15 19	28.096	+.207	S -14 33	34.82	-1.76		0.491008
70 12 29.58	0950.08577	G	2	15 25	42.391	+.135	S -14 52	37.77	-0.35		0.505571
70 12 30.58	0951.08526	R	2	15 28	55.254	+.163	S -15 02	34.77	-0.72		0.512900

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 11

JUPITER

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s	s			° ' "	"		
70 03 15.32	0660.82747	L	14 13	19.378	-.007		-11 51 48.66	-0.09		4.653268
70 03 17.32	0662.82162	M	14 12	45.904	-.048		-11 48 35.51	-0.19		4.632325
70 03 23.30	0668.80392	L	14 10	51.491	-.005		-11 37 46.16	-0.39		4.575139
70 03 24.30	0669.80095	C	14 10	30.491	+.010		-11 35 47.88	+0.06		4.566467
70 03 25.29	0670.79797	W	14 10	08.888	-.060		-11 33			4.558049
70 03 26.29	0671.79498	J	14 09				-11 31 44.79	-0.20		4.549887
70 03 27.29	0672.79199	P	14 09	24.416	+.036		-11 29 39.24	+0.01		4.541985
70 03 28.28	0673.78900	Z	14 09	01.360	-.013		-11 27			4.534347
70 03 30.28	0675.78299	L	14 08	13.957	-.023		-11 23 09.44	-0.05		4.519873
70 04 01.27	0677.77696	J	14 07	24.819	-.018		-11 18 38.27	+0.40		4.506489
70 04 04.26	0680.76788	L	14 06	08.070	-.039		-11 11 38.16	-0.31		4.488510
70 04 05.26	0681.76485	L	14 05	41.784	-.018		-11 09 14.44	-0.45		4.483087
70 04 06.26	0682.76181	J	14 05	15.120	-.045		-11 06 49.40	-0.86		4.477953
70 04 11.24	0687.74657	Z	14 02	57.693	-.033		-10 54 21.19	-0.13		4.456684
70 04 13.24	0689.74046	C	14 02	01.104	-.029		-10 49 15.11	-0.47		4.450256
70 04 16.23	0692.73127	M	14 00	34.962	-.027		-10 41 29.61	-0.04		4.442865
70 04 18.22	0694.72514	Z	13 59				-10 36 18.16	-1.06		4.439443
70 04 19.22	0695.72208	J	13 59	07.824	-.001		-10 33 40.74	-0.30		4.438185
70 04 22.21	0698.71287	C	13 57	40.176	-.017		-10 25 50.33	-0.20		4.436219
70 04 23.20	0699.70981	P	13 57				-10 23 14.41	-0.79		4.436167
70 04 29.19	0705.69141	Z	13 54	16.910	+.015		-10 07 45.73	-0.99		4.442164
70 05 02.18	0708.68224	B	13 52	51.450	-.022		-10 00 11.64	-0.22		4.449199
70 05 06.17	0712.67003	H	13 51	00.480	-.009		- 9 50 25.23	+0.10		4.462706
70 05 08.16	0714.66395	W	13 50	06.595	-.016		- 9 45 42.84	-0.55		4.471198
70 05 09.16	0715.66091	D	13 49	40.136	-.001		- 9 43			4.475871
70 05 10.15	0716.65788	H	13 49	13.958	-.038		- 9 41 08.41	-1.38		4.480826
70 05 13.14	0719.64881	D	13 47	57.700	-.028		- 9 34 30.12	+0.16		4.497347
70 05 18.13	0724.63379	B	13 45	58.651	-.065		- 9 24 17.28	+0.37		4.530234
70 05 19.13	0725.63080	H	13 45	36.179	-.083		- 9 22 23.85	-0.70		4.537586
70 05 20.12	0726.62781	L	13 45	14.291	+.003		- 9 20 32.60	-1.09		4.545189
70 05 21.12	0727.62483	D	13 44	52.802	-.006		- 9 18 43.50	-0.71		4.553038
70 05 22.12	0728.62186	W	13 44	31.763	-.068		- 9 16 57.69	-0.62		4.561131
70 05 23.11	0729.61889	B	13 44	11.336	-.031		- 9 15 14.81	-0.40		4.569465
70 05 26.11	0732.61003	H	13 43	13.098	-.045		- 9 10 25.98	-0.70		4.595881
70 05 27.10	0733.60709	Z	13 42	54.828	+.007		- 9 08 55.29	+0.06		4.605146
70 05 28.10	0734.60415	R	13 42	36.975	-.083		- 9 07 29.14	-0.41		4.614636
70 05 30.09	0736.59830	D	13 42	03.213	-.039		- 9 04 46.14	-0.46		4.634274
70 05 31.09	0737.59539	W	13 41	47.214	-.019		- 9 03 29.31	+0.06		4.644416
70 06 01.09	0738.59248	K	13 41	31.792	-.026		- 9 02 17.08	-0.46		4.654768
70 06 02.08	0739.58958	B	13 41	16.971	-.043		- 9 01 07.23	+0.26		4.665325
70 06 07.07	0744.57518	J	13 40	12.352	-.061		- 8 56 17.76	-0.14		4.721048
70 06 08.07	0745.57232	H	13 40	01.383	-.032		- 8 55 30.83	+0.17		4.732749
70 06 10.06	0747.56663	W	13 39	41.332	-.041		- 8 54 09.60	-0.33		4.756670
70 06 11.06	0748.56379	B	13 39	32.299	-.039		- 8 53 34.36	-0.17		4.768882
70 06 12.06	0749.56097	L	13 39	23.920	-.045		- 8 53 02.77	+0.23		4.781255
70 06 14.05	0751.55534	H	13 39	09.155	-.065		- 8 52 12.19	+0.08		4.806466
70 06 15.05	0752.55253	G	13 39	02.780	-.074		- 8 51 52.44	+0.32		4.819296
70 06 21.03	0758.53587	L	13 38	38.773	-.049		- 8 51			4.899133
70 06 23.03	0760.53038	L	13 38	36.157	-.030		- 8 51 37.58	+0.40		4.926738
70 06 24.02	0761.52765	H	13 38	35.818	-.054		- 8 51 53.70	-0.07		4.940709
70 07 01.00	0768.50872	G	13 38	52.372	-.117		- 8 55 32.34	-0.77		5.041144
70 07 05.99	0773.49544	F	13 39	24.380	-.060		- 9 00 02.98	-0.71		5.115509
70 07 17.96	0785.46432	H	13 41	46.964	-.010		- 9 17			5.298316
70 07 18.96	0786.46177	P	13 42	02.818	-.072		- 9 18			5.313689

SATURN

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s	s			° ' "	"		
69 09 22.31	0486.81295	L	2 26	20.253	-.063	+11 40	01.85	+0.40		8.438785
69 09 23.31	0487.81008	P	2 26	08.200	+.001	+11 38	51.60	+1.14		8.428527
69 09 29.29	0493.79278	L	2 24	49.106	+.025	+11 31	17.90	+0.98		8.372004
69 09 30.28	0494.78989	K	2 24	34.874	-.016	+11 29	57.47	+0.36		8.363452
69 10 01.28	0495.78699	R	2 24	20.417	-.014	+11 28	36.81	+0.66		8.355158
69 10 04.27	0498.77828	X	2 23	35.497	+.002	+11 24	27.28	+0.24		8.331853
69 10 06.27	0500.77246	L	2 23	04.305	.000	+11 21	36.20	+0.16		8.317664
69 10 10.26	0504.76079	R	2 21	59.262	+.010	+11 15	44.22	+0.58		8.292629
69 10 11.25	0505.75786	J	2 21	42.506	+.021	+11 14	14.02	+0.38		8.287083
69 10 13.25	0507.75201	A	2 21	08.421	-.004	+11 11	11.70	-0.05		8.276865
69 10 20.23	0514.73147	P	2 19	04.650	-.024	+11 00	21.47	+0.35		8.250472
69 10 24.21	0518.71970	J	2 17	51.658	+.001	+10 54	04.17	+0.26		8.242052
69 10 29.20	0523.70498	A	2 16	19.276	-.001	+10 46	12.51	-0.42		8.238432
69 10 30.20	0524.70204	X	2 16	00.704	-.047	+10 44	39.03	-0.32		8.238635
69 10 31.19	0525.69909	P	2 15	42.203	-.025	+10 43	06.43	+0.35		8.239148
69 11 12.16	0537.66381	B	2 12	04.047	+.024	+10 25	10.61	+0.12		8.269436
69 11 17.14	0542.64917	W	2 10	38.083	+.026	+10 18	20.61	+0.12		8.294984
69 11 19.14	0544.64332	L	2 10	04.901	-.006	+10 15	44.97	+0.08		8.307252
69 11 21.13	0546.63749	D	2 09	32.591	+.010	+10 13				8.320661
69 11 22.13	0547.63458	W	2 09			+10 12	01.94	+0.30		8.327786
69 11 23.13	0548.63167	L	2 09	01.175	+.020	+10 10	50.16	+0.04		8.335188
69 11 25.12	0550.62585	P	2 08	30.687	-.006	+10 08	32.00	+0.29		8.350815
69 11 26.12	0551.62295	X	2 08			+10 07	24.47	-0.43		8.359034
69 11 29.11	0554.61426	P	2 07	32.894	+.015	+10 04	14.55	+0.16		8.385276
69 12 02.10	0557.60561	B	2 06	52.463	+.007	+10 01				8.413834
70 09 02.40	0831.90771	L	3 23	22.235	+.017	+16 07	47.72	+0.35		8.813290
70 09 07.39	0836.89406	F	3 23	22.635	-.015	+16 06	44.45	+1.40		8.735419
70 09 08.39	0837.89132	D	3 23	21.425	-.022	+16 06				8.720143
70 09 12.38	0841.88029	Z	3 23	12.411	+.063	+16 05				8.660183
70 09 13.37	0842.87752	F	3 23	08.978	-.022	+16 04				8.645502
70 09 14.37	0843.87475	L	3 23	05.241	+.016	+16 04	08.94	+0.25		8.630953
70 09 15.37	0844.87197	P	3 23	01.024	-.001	+16 03				8.616540
70 09 16.36	0845.86919	F	3 22	56.396	-.007	+16 03				8.602267
70 09 17.36	0846.86640	I	3 22	51.373	+.009	+16 02				8.588139
70 09 20.35	0849.85800	G	3 22	33.757	-.008	+16 00	58.48	+0.58		8.546665
70 09 21.35	0850.85520	Z	3 22	27.054	-.024	+16 00	21.28	+0.22		8.533159
70 09 22.35	0851.85238	H	3 22	19.994	+.014	+15 59	43.57	+0.76		8.519820
70 09 24.34	0853.84674	J	3 22	04.558	-.006	+15 58	22.27	+0.13		8.493662
70 09 25.34	0854.84392	P	3 21	56.256	+.007	+15 57	40.37	+0.64		8.480853
70 09 26.34	0855.84109	Z	3 21	47.477	-.057	+15 56	56.05	+0.10		8.468229
70 09 30.32	0859.82972	Z	3 21	08.817	+.059	+15 53	47.54	+0.09		8.419687
70 10 01.32	0860.82686	F	3 20	58.102	-.009	+15 52	57.98	+0.90		8.408062
70 10 02.32	0861.82401	I	3 20	47.129	+.032	+15 52	04.34	-1.11		8.396651
70 10 03.32	0862.82114	P	3 20	35.683	-.036	+15 51	12.94	+0.32		8.385457
70 10 04.31	0863.81828	G	3 20	23.961	-.026	+15 50	18.16	-0.44		8.374484
70 10 05.31	0864.81541	H	3 20	11.896	-.008	+15 49	23.33	-0.11		8.363737
70 10 06.31	0865.81254	D	3 19	59.419	-.058	+15 48	26.39	-0.76		8.353220
70 10 07.30	0866.80966	I	3 19	46.686	-.027	+15 47	30.63	+0.87		8.342937
70 10 08.30	0867.80678	W	3 19	33.583	-.033	+15 46	32.33	+1.03		8.332889
70 10 10.30	0869.80100	J	3 19	06.482	+.039	+15 44	31.02	-0.23		8.313520
70 10 13.29	0872.79231	P	3 18	23.342	+.002	+15 41	24.26	+0.70		8.286327
70 10 14.28	0873.78941	J	3 18	08.384	+.004	+15 40	19.70	+0.64		8.277770
70 10 17.28	0876.78068	W	3 17	21.856	+.007	+15 37	00.43	+0.20		8.253669
70 10 18.27	0877.77777	G	3 17	05.806	-.006	+15 35	52.91	+0.60		8.246167
70 10 19.27	0878.77485	I	3 16	49.460	-.064	+15 34	45.31	+1.68		8.238937

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 13

SATURN

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
244										
			h m s	s			° ' "	"		
70 10 20.27	0879.77193	D	3 16	32.972	-.019		+15 33			8.231982
70 11 08.21	0898.71603	I	3 10	44.602	-.037		+15 10	02.34	+0.36	8.155403
70 11 16.19	0906.69239	F	3 08	09.227	+.013		+14 59	57.83	+1.27	8.156272
70 11 17.18	0907.68944	S	3 07	49.839	-.037		+14 58	41.43	-0.85	8.157781
70 11 18.18	0908.68648	I	3 07	30.556	-.033		+14 57	27.15	-1.28	8.159600
70 11 21.17	0911.67763	H	3 06	33.121	-.017		+14 53	51.62	+1.67	8.166921
70 11 22.17	0912.67468	W	3 06	14.096	-.065		+14 52	39.53	+1.25	8.169979
70 12 01.14	0921.64820	D	3 03	29.502	-.031		+14 42	29.58	+1.11	8.211224
70 12 03.14	0923.64234	R	3 02	54.869	-.058		+14 40			8.223669
70 12 05.13	0925.63649	I	3 02	21.163	-.037		+14 38	23.78	+0.27	8.237264
70 12 07.13	0927.63065	I	3 01	48.401	-.028		+14 36			8.251985
70 12 08.12	0928.62774	T	3 01	32.328	-.099		+14 35	32.48	+0.18	8.259760
70 12 09.12	0929.62483	P	3 01	16.691	-.002		+14 34	37.43	-0.37	8.267808
70 12 14.11	0934.61032	T	3 00	02.307	-.035		+14 30	26.44	-0.03	8.312018
70 12 15.10	0935.60742	D	2 59	48.357	-.022		+14 29	41.26	+0.63	8.321631
70 12 20.09	0940.59302	G	2 58	43.432	-.001		+14 26			8.373372
70 12 28.07	0948.57019	R	2 57	18.141	-.004		+14 22	14.30	+0.16	8.467985
70 12 29.06	0949.56736	R	2 57	09.241	+.013		+14 21	52.55	+0.30	8.480748
70 12 30.06	0950.56453	G	2 57	00.653	-.060		+14 21	32.32	+0.06	8.493704
70 12 31.06	0951.56171	S	2 56	52.572	-.030		+14 21			8.506847

URANUS

70 02 18.32	0635.82512	W	12 31	22.015	-.035	- 2 34	27.95	-0.47		17.540100
70 02 21.31	0638.81669	L	12 31	01.505	-.053	- 2 32	11.85	-0.54		17.508552
70 02 22.31	0639.81388	A	12 30	54.388	-.059	- 2 31	23.92	+0.27		17.498521
70 02 24.30	0641.80825	A	12 30	39.753	-.074	- 2 29	47.64	-0.16		17.479224
70 02 25.30	0642.80543	J	12 30	32.281	-.045	- 2 28	58.36	-0.41		17.469960
70 02 28.29	0645.79697	L	12 30	09.033	-.075	- 2 26	26.20	-1.23		17.443723
70 03 07.27	0652.77719	M	12 29	11.110	-.044	- 2 20	05.27	-0.18		17.392041
70 03 15.25	0660.75453	L	12 27	59.680	-.058	- 2 12	18.90	+1.13		17.350167
70 03 23.23	0668.73182	L	12 26	44.848	-.039	- 2 04	16.12	-0.31		17.327381
70 03 24.22	0669.72898	C	12 26	35.336	-.052	- 2 03	14.43	+0.14		17.325893
70 03 25.22	0670.72614	W	12 26	25.832	-.042	- 2 02	13.48	-0.22		17.324698
70 03 28.21	0673.71762	L	12 25	57.192	-.092	- 1 59	09.73	-0.42		17.322945
70 03 30.21	0675.71194	L	12 25	38.179	-.046	- 1 57	07.08	-0.19		17.323295
70 04 01.20	0677.70626	L	12 25	19.128	-.065	- 1 55	05.10	-0.26		17.324858
70 04 04.19	0680.69774	B	12 24	50.674	-.074	- 1 52	03.01	-0.25		17.329479
70 04 05.19	0681.69490	L	12 24	41.247	-.065	- 1 51	02.74	-0.28		17.331624
70 04 06.19	0682.69206	W	12 24	31.858	-.052	- 1 50	03.40	-1.00		17.334074
70 04 09.18	0685.68354	C	12 24	03.940	-.020	- 1 47	04.53	-0.35		17.343207
70 04 11.17	0687.67787	W	12 23	45.528	-.053	- 1 45	07.10	+0.14		17.350772
70 04 13.17	0689.67220	D	12 23	27.370	-.067	- 1 43	12.09	-0.07		17.359510
70 04 16.16	0692.66370	D	12 23	00.643	-.069	- 1 40	23.09	-0.39		17.374761
70 04 19.15	0695.65521	R	12 22	34.622	-.040	- 1 37	38.36	-0.24		17.392545
70 04 21.14	0697.64955	B	12 22	17.684	-.041	- 1 35	51.28	+0.08		17.405780
70 04 22.14	0698.64673	C	12 22	09.355	-.044	- 1 34	58.34	+0.63		17.412800
70 04 23.14	0699.64390	B	12 22	01.116	-.056	- 1 34	07.47	-0.21		17.420089
70 04 26.13	0702.63543	H	12 21	37.035	-.091	- 1 31	37.66	-1.21		17.443532
70 04 28.12	0704.62979	D	12 21	21.587	-.056	- 1 30	00.02	-0.39		17.460452
70 04 29.12	0705.62697	Z	12 21	14.019	-.051	- 1 29	12.53	-0.16		17.469290
70 05 06.10	0712.60729	H	12 20	24.472	-.071	- 1 24	06.00	-0.91		17.538003
70 05 08.10	0714.60168	W	12 20	11.604	-.030	- 1 22	45.84	-0.19		17.559720

URANUS

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
244			h m s	s			° ' "	"		
70 05 09.09	0715.59888	D	12 20	05.362	-.038	- 1 22	07.69	-0.28		17.570919
70 05 10.09	0716.59608	H	12 19	59.273	-.042	- 1 21	30.49	-0.34		17.582318
70 05 13.08	0719.58768	D	12 19	41.929	-.040	- 1 19	44.62	-0.12		17.617796
70 05 19.07	0725.57095	H	12 19	11.512	-.046	- 1 16	41.38	+0.27		17.693972
70 05 20.06	0726.56817	L	12 19	07.018	-.057	- 1 16	15.42	-0.38		17.707307
70 05 21.06	0727.56539	D	12 19	02.712	-.054	- 1 15	49.50	+0.09		17.720810
70 05 22.06	0728.56261	W	12 18	58.570	-.061	- 1 15	25.63	-0.35		17.734472
70 05 23.05	0729.55983	B	12 18	54.640	-.032	- 1 15	02.03	+0.10		17.748294
70 05 27.04	0733.54875	Z	12 18	40.568	-.021	- 1 13	41.10	+0.03		17.805149
70 05 28.04	0734.54598	R	12 18	37.457	-.051	- 1 13	23.94	-0.18		17.819726
70 05 29.04	0735.54322	H	12 18	34.551	-.056	- 1 13	07.46	+0.12		17.834451
70 05 30.04	0736.54046	D	12 18	31.825	-.063	- 1 12	52.68	-0.07		17.849295
70 05 31.03	0737.53770	W	12 18	29.313	-.043	- 1 12	39.12	-0.27		17.864279
70 06 01.03	0738.53494	K	12 18	26.987	-.024	- 1 12	26.02	+0.30		17.879382
70 06 02.03	0739.53219	B	12 18	24.801	-.055	- 1 12	14.74	+0.30		17.894613
70 12 29.47	0949.97816	D	12 50	19.021	-.046	- 4 38	52.54	-0.31		18.413463
70 12 30.47	0950.97547	G	12 50	23.092	-.039	- 4 39	15.76	-0.13		18.396369

NEPTUNE

70 04 01.35	0677.85185	J	15 55	33.039	-.353	-18 36	25.59	+1.05		29.663837
70 04 04.34	0680.84353	L	15 55	21.511	-.328	-18 35	43.39	+1.13		29.625263
70 04 05.34	0681.84075	L	15 55	17.441	-.327	-18 35	28.41	+1.44		29.612805
70 04 06.33	0682.83797	J	15 55	13.271	-.320	-18 35	13.89	+1.00		29.600552
70 04 11.32	0687.82406	Z	15 54	50.888	-.349	-18 33	53.25	+2.85		29.542593
70 04 13.31	0689.81849	C	15 54	41.293	-.342	-18 33	21.02	+1.96		29.521005
70 04 16.31	0692.81013	M	15 54	26.231	-.320	-18 32	30.38	+1.24		29.490388
70 04 17.30	0693.80734	C	15 54	21.011	-.338	-18 32	12.68	+1.38		29.480673
70 04 22.29	0698.79337	J	15 53	53.848	-.314	-18 30	42.23	+0.86		29.435827
70 04 23.29	0699.79057	P	15 53	48.184	-.327	-18 30	22.96	+1.39		29.427630
70 04 29.27	0705.77378	J	15 53	12.921	-.351	-18 28	27.62	+1.37		29.383974
70 05 13.23	0719.73453	L	15 51	43.822	-.301	-18 23	43.63	+1.42		29.321163
70 05 20.21	0726.71488	L	15 50	57.296	-.312	-18 21	20.11	+0.47		29.311042
70 05 21.21	0727.71207	C	15 50	50.631	-.310	-18 20	58.52	+1.50		29.310765
70 05 27.19	0733.69523	Z	15 50	10.679	-.354	-18 18	57.24	+1.02		29.315221
70 05 28.19	0734.69242	R	15 50	04.074	-.333	-18 18	37.09	+1.14		29.316982
70 05 29.18	0735.68962	H	15 49	57.498	-.296	-18 18	17.07	+1.20		29.319032
70 05 30.18	0736.68681	D	15 49	50.878	-.321	-18 17	57.09	+1.30		29.321371
70 05 31.18	0737.68400	W	15 49	44.303	-.324	-18 17	37.59	+1.03		29.324009
70 06 07.16	0744.66437	J	15 48	59.185	-.318	-18 15	22.55	+1.72		29.350452
70 06 08.16	0745.66156	H	15 48	52.846	-.357	-18 15	04.79	+0.98		29.355365
70 06 10.15	0747.65596	W	15 48	40.405	-.327	-18 14	27.61	+1.73		29.366014
70 06 11.15	0748.65316	B	15 48	34.234	-.331	-18 14	10.66	+0.74		29.371759
70 06 12.15	0749.65036	L	15 48	28.096	-.351	-18 13	52.16	+1.49		29.377762
70 06 24.11	0761.61680	H	15 47	19.572	-.312	-18 10	37.83	+1.22		29.470197
70 06 28.10	0765.60564	P	15 46	58.988	-.315	-18 09	40.32	+2.39		29.508914
70 06 29.10	0766.60285	W	15 46	54.028	-.341	-18 09	27.82	+1.55		29.519179
70 07 06.08	0773.58337	H	15 46	22.125	-.288	-18 08	03.87	+1.66		29.597233
70 07 14.06	0781.56117	W	15 45	51.510	-.299	-18 06				29.698541
70 07 18.05	0785.55011	H	15 45	38.849	-.313	-18 06				29.753435
70 07 20.04	0787.54458	F	15 45	33.245	-.274	-18 06				29.781832

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 15

CERES

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s		s		° ' "	"	"	
69 08 06.19	0439.69547	J	20 31	24.240	+0.061	-30 45	14.62	+1.98		1.973593
69 08 14.16	0447.66883	J	20 24	29.012	+0.065	-31 13	48.58	+0.90		2.006732
69 08 22.14	0455.64281	R	20 18	27.427	+0.072	-31 32	10.46	+1.01		2.055923
69 08 24.13	0457.63644	Q	20 17	08.270	+0.025	-31 35	10.26	+1.93		2.070544
69 08 27.12	0460.62699	P	20 15	19.226	+0.035	-31 38	32.30	+2.58		2.094102
69 09 01.11	0465.61155	L	20 12	44.819	+0.042	-31 41	17.02	+0.71		2.137469
69 09 11.08	0475.58198	R	20 09	27.949	+0.103	-31 36	42.50	+0.64		2.238023
69 09 14.07	0478.57346	Q	20 08	59.403	+0.102	-31 32	59.20	+1.01		2.271333
69 09 16.06	0480.56787	R	20 08	48.325	+0.076	-31 29	57.35	+1.36		2.294244
69 09 19.05	0483.55962	Q	20 08	43.668	+0.082	-31 24	39.15	+0.98		2.329578
69 09 22.05	0486.55154	R	20 08	53.131	+0.090	-31 18	28.24	+1.05		2.365972
69 09 23.04	0487.54888	K	20 08	59.321	+0.040	-31 16	13.53	+1.05		2.378321
69 09 24.04	0488.54624	R	20 09	07.160	+0.137	-31 13	53.22	+1.57		2.390773
69 09 30.03	0494.53076	B	20 10	24.818	+0.054	-30 58	06.82	+2.18		2.467440
69 10 10.00	0504.50625	B	20 14	27.549	+0.045	-30 25	46.28	+1.07		2.601190
69 10 11.00	0505.50389	X	20 14	59.160	+0.064	-30 22	08.16	+1.98		2.614869
69 10 12.00	0506.50154	M	20 15	32.023	+0.051	-30 18	26.67	+2.29		2.628591
69 10 17.98	0512.48773	D	20 19	15.119	+0.120	-29 55				2.711602
69 10 19.98	0514.48323	L	20 20	38.766	+0.088	-29 46	40.81	+1.83		2.739451
69 10 23.97	0518.47439	R	20 23	39.175	+0.116	-29 29	22.60	+0.95		2.795277
69 10 24.97	0519.47221	A	20 24	26.870	+0.103	-29 24	54.08	+0.94		2.809245
69 11 10.93	0536.43679	R	20 40	19.013	+0.050	-28 00	24.84	+1.00		3.044745
70 08 26.39	0824.89414	H	2 36	10.820	-0.064	+ 2 59	55.86	+0.55		2.332734
70 08 27.39	0825.89157	J	2 36	24.417	-0.092	+ 2 58	32.55	+0.54		2.320256
70 08 29.38	0827.88638	I	2 36	47.664	-0.141	+ 2 55	27.61	-0.14		2.295583
70 09 02.37	0831.87581	L	2 37	18.060	-0.106	+ 2 48	10.88	+0.26		2.247479
70 09 07.36	0836.86223	F	2 37	24.840	-0.085	+ 2 37	02.18	+0.03		2.190019
70 09 08.35	0837.85947	D	2 37	21.926	-0.126	+ 2 34	33.65	+0.45		2.178923
70 09 12.34	0841.84825	Z	2 36	56.196	-0.089	+ 2 23	50.62	+0.14		2.135999
70 09 13.34	0842.84540	F	2 36	46.151	-0.105	+ 2 20	59.44	+0.82		2.125650
70 09 14.34	0843.84254	L	2 36	34.681	-0.121	+ 2 18	02.96	+0.30		2.115462
70 09 15.33	0844.83966	P	2 36	21.770	-0.135	+ 2 15				2.105440
70 09 16.33	0845.83676	F	2 36	07.432	-0.133	+ 2 11				2.095585
70 09 17.33	0846.83385	I	2 35	51.688	-0.102	+ 2 08				2.085903
70 09 21.32	0850.82204	Z	2 34	34.314	-0.123	+ 1 55	43.75	+0.21		2.048977
70 09 22.31	0851.81904	H	2 34	11.414	-0.128	+ 1 52	19.35	+0.40		2.040218
70 09 24.31	0853.81301	J	2 33	21.403	-0.136	+ 1 45	22.07	+0.32		2.023297
70 09 25.30	0854.80996	P	2 32	54.326	-0.128	+ 1 41	49.70	+0.13		2.015145
70 09 26.30	0855.80690	Z	2 32	25.914	-0.090	+ 1 38	15.20	-0.01		2.007203
70 09 27.30	0856.80383	I	2 31	56.067	-0.128	+ 1 34	39.66	+0.63		1.999475
70 09 30.29	0859.79451	Z	2 30	18.734	-0.123	+ 1 23	41.82	+0.11		1.977627
70 10 01.29	0860.79138	F	2 29	43.709	-0.141	+ 1 20				1.970801
70 10 02.28	0861.78823	I	2 29	07.496	-0.121	+ 1 16	19.48	+0.52		1.964211
70 10 03.28	0862.78507	P	2 28	30.040	-0.130	+ 1 12	37.41	+0.38		1.957858
70 10 04.28	0863.78189	G	2 27	51.393	-0.160	+ 1 08	55.02	-0.14		1.951749
70 10 06.27	0865.77550	D	2 26	30.774	-0.174	+ 1 01	33.22	+0.48		1.940271
70 10 07.27	0866.77229	I	2 25	48.893	-0.135	+ 0 57	52.57	-0.27		1.934908
70 10 08.26	0867.76906	W	2 25	05.919	-0.167	+ 0 54	13.97	-0.10		1.929799
70 10 17.23	0876.73957	W	2 17	59.858	-0.151	+ 0 23	06.94	-0.26		1.895664
70 10 19.23	0878.73293	I	2 16	17.485	-0.176	+ 0 16	50.24	+0.31		1.891063
70 11 07.16	0897.66944	W	1 59	31.965	-0.129	- 0 22	15.59	+0.25		1.903686
70 11 08.16	0898.66613	F	1 58	41.586	-0.179	- 0 22	58.76	+0.79		1.907146
70 11 17.13	0907.63673	S	1 51	43.436	-0.163	- 0 22	32.69	-0.52		1.949987
70 11 18.13	0908.63352	K	1 51	01.614	-0.143	- 0 21	41.00	+0.19		1.955997
70 11 22.12	0912.62079	W	1 48	25.270	-0.125	- 0 16	39.81	+0.38		1.982385

CERES

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s	s			° ' "	"		
70 12 01.09	0921.59299	D	1 43	46.010	-.115		+ 0 04	02.24	-0.08	2.054507
70 12 03.08	0923.58699	R	1 42	58.899	-.124		+ 0 10	21.91	-0.33	2.072700
70 12 05.08	0925.58105	I	1 42	17.473	-.136		+ 0 17	17.47	-0.82	2.091601
70 12 08.07	0928.57226	T	1 41	26.184	-.130		+ 0 28	48.94	+1.08	2.121195
70 12 15.05	0935.55236	D	1 40	17.425	-.114		+ 1 00	24.70	-0.25	2.195416
70 12 20.03	0940.53864	G	1 40	11.553	-.139		+ 1 26			2.252238
70 12 25.02	0945.52533	R	1 40	41.134	-.094		+ 1 56	00.74	+0.43	2.311667
70 12 28.01	0948.51753	R	1 41	15.499	-.098		+ 2 14	48.49	+0.22	2.348365
70 12 29.01	0949.51496	R	1 41	29.696	-.077		+ 2 21	16.24	+0.08	2.360746
70 12 30.01	0950.51241	G	1 41	45.179	-.112		+ 2 27	49.53	-0.11	2.373195
70 12 31.00	0951.50988	S	1 42	02.039	-.094		+ 2 34	28.98	+0.20	2.385708

PALLAS

70 08 02.28	0800.78392	Q	22 22	24.558	-.159		+10 34	50.74	+0.42	2.458317
70 08 03.28	0801.78078	F	22 21	48.841	-.157		+10 28	23.32	-0.14	2.449762
70 08 11.25	0809.75534	W	22 16	36.694	-.149		+ 9 28	40.31	-0.18	2.390004
70 08 13.24	0811.74890	P	22 15	12.492	-.176		+ 9 11	33.32	+0.48	2.377612
70 08 21.22	0819.72298	J	22 09	19.482	-.188		+ 7 54	54.29	-0.34	2.338939
70 08 22.21	0820.71973	I	22 08	34.135	-.195		+ 7 44	28.50	-0.20	2.335372
70 08 24.21	0822.71322	P	22 07	03.112	-.151		+ 7 23	05.37	-0.37	2.329111
70 08 25.20	0823.70996	Z	22 06	17.521	-.102		+ 7 12	09.07	-0.26	2.326421
70 08 27.20	0825.70345	J	22 04	46.159	-.205		+ 6 49	48.62	+0.23	2.321930
70 08 29.19	0827.69694	R	22 03	15.219	-.166		+ 6 26	51.96	-0.41	2.318634
70 09 02.18	0831.68394	G	22 00	15.582	-.155		+ 5 39	27.53	-0.55	2.315658
70 09 03.18	0832.68070	P	21 59	31.369	-.178		+ 5 27	20.06	-0.39	2.315668
70 09 06.17	0835.67101	H	21 57	21.321	-.163		+ 4 50	24.18	-0.54	2.317512
70 09 07.16	0836.66779	I	21 56	38.897	-.195		+ 4 37	56.72	-0.10	2.318726
70 09 08.16	0837.66458	L	21 55	57.068	-.182		+ 4 25	24.51	-0.65	2.320240
70 09 12.15	0841.65179	R	21 53	15.978	-.146		+ 3 34	49.27	+0.10	2.329244
70 09 13.14	0842.64862	J	21 52	37.406	-.153		+ 3 22	04.49	-0.62	2.332223
70 09 14.14	0843.64545	G	21 51	59.596	-.166		+ 3 09	19.08	-0.93	2.335489
70 09 21.12	0850.62356	F	21 47	58.701	-.157		+ 1 40	10.25	-0.21	2.366195
70 09 22.12	0851.62047	D	21 47	28.036	-.139		+ 1 27	31.89	-0.42	2.371673
70 09 25.11	0854.61129	D	21 46	02.111	-.163		+ 0 49	54.82	-0.57	2.389680
70 09 26.10	0855.60825	H	21 45	35.618	-.157		+ 0 37	29.63	-0.77	2.396195
70 09 27.10	0856.60523	J	21 45	10.218	-.152		+ 0 25	09.14	-0.48	2.402961
70 09 29.09	0858.59922	D	21 44	22.777	-.151		+ 0 00	42.00	-0.27	2.417229
70 09 30.09	0859.59624	J	21 44	00.781	-.157		- 0 11	23.60	-0.19	2.424724
70 10 01.09	0860.59327	P	21 43	39.952	-.170		- 0 23	23.97	-0.46	2.432452
70 10 05.08	0864.58152	F	21 42	28.724	-.176		- 1 10	21.04	-0.55	2.465617
70 10 07.07	0866.57574	R	21 42	00.543	-.136		- 1 33	07.59	-0.54	2.483483
70 10 08.07	0867.57287	H	21 41	48.276	-.152		- 1 44	20.10	-1.16	2.492720
70 10 13.05	0872.55872	H	21 41	05.883	-.151		- 2 38	17.03	-0.13	2.541741
70 10 19.04	0878.54223	F	21 40	56.548	-.124		- 3 38	12.96	-0.24	2.606179
70 11 06.99	0897.49337	W	21 45	18.044	-.161		- 6 09	31.62	+1.05	2.839615
70 11 07.99	0898.49094	F	21 45	43.478	-.126		- 6 15	49.90	+0.12	2.852722
70 11 16.96	0907.46955	S	21 50	19.409	-.106		- 7 05	06.84	-0.14	2.972409
70 11 17.96	0908.46723	K	21 50	55.096	-.106		- 7 09	47.49	-0.15	2.985831
70 11 19.96	0910.46262	F	21 52	09.354	-.080		- 7 18	40.42	+0.15	3.012704

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 17

JUNO

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
	244		h m s	s			° ' "	"		
70 08 27.42	0825.92062	J	3 18	21.825	+ .171	+ 9 07	11.69	-0.36		1.570399
70 09 02.40	0831.90935	L	3 25	44.815	+ .151	+ 8 38	05.96	-0.70		1.502898
70 09 07.39	0836.89958	F	3 31	20.823	+ .145	+ 8 08	16.04	-0.85		1.448569
70 09 08.39	0837.89758	D	3 32	24.121	+ .147	+ 8 01	42.53	0.00		1.437937
70 09 12.38	0841.88942	Z	3 36	23.400	+ .143	+ 7 33	24.41	-0.22		1.396263
70 09 13.38	0842.88734	F	3 37	19.643	+ .166	+ 7 25	49.94	-0.40		1.386066
70 09 14.38	0843.88524	L	3 38	14.367	+ .150	+ 7 18	03.68	-0.43		1.375961
70 09 15.38	0844.88312	P	3 39	07.560	+ .121	+ 7 10				1.365951
70 09 16.38	0845.88099	F	3 39	59.259	+ .152	+ 7 01				1.356036
70 09 20.37	0849.87227	G	3 43	09.959	+ .154	+ 6 27	20.35	-0.34		1.317377
70 09 21.37	0850.87004	Z	3 43	53.477	+ .140	+ 6 18	12.74	-0.63		1.307974
70 09 22.36	0851.86779	H	3 44	35.315	+ .163	+ 6 08	54.46	-0.39		1.298680
70 09 24.36	0853.86324	J	3 45	53.635	+ .143	+ 5 49	44.41	-0.71		1.280433
70 09 25.36	0854.86093	P	3 46	30.146	+ .167	+ 5 39	53.85	-0.54		1.271485
70 09 26.35	0855.85860	Z	3 47	04.817	+ .182	+ 5 29	52.82	-0.40		1.262657
70 09 27.35	0856.85625	I	3 47	37.603	+ .162	+ 5 19	41.03	-0.81		1.253953
70 10 01.34	0860.84662	F	3 49	29.903	+ .140	+ 4 37	20.42	-0.34		1.220433
70 10 02.34	0861.84416	I	3 49	53.198	+ .157	+ 4 26	22.21	-0.82		1.212392
70 10 03.34	0862.84167	P	3 50	14.530	+ .168	+ 4 15	16.72	-0.37		1.204492
70 10 04.33	0863.83917	G	3 50	33.896	+ .172	+ 4 04	02.73	-0.63		1.196737
70 10 05.33	0864.83664	H	3 50	51.265	+ .146	+ 3 52	41.14	-1.04		1.189129
70 10 06.33	0865.83409	D	3 51	06.655	+ .122	+ 3 41	13.76	-0.17		1.181670
70 10 07.33	0866.83151	I	3 51	20.099	+ .137	+ 3 29	39.00	-0.19		1.174364
70 10 08.32	0867.82891	W	3 51	31.575	+ .170	+ 3 17	57.70	-0.61		1.167214
70 10 13.31	0872.81558	P	3 51	58.925	+ .134	+ 2 18	17.85	-0.32		1.133879
70 10 17.30	0876.80450	W	3 51	45.266	+ .146	+ 1 29	33.24	-0.99		1.110255
70 10 18.30	0877.80167	G	3 51	36.991	+ .175	+ 1 17	19.28	-0.49		1.104793
70 10 19.29	0878.79882	I	3 51	26.718	+ .125	+ 1 05	05.99	+0.83		1.099513
70 10 20.29	0879.79595	D	3 51	14.635	+ .190	+ 0 52	50.25	-0.75		1.094419
70 11 08.23	0898.73780	I	3 42	11.526	+ .146	- 2 40	44.87	-0.46		1.036023
70 11 16.21	0906.71200	F	3 36	28.578	+ .161	- 3 46	57.13	+0.01		1.034691
70 11 17.20	0907.70876	S	3 35	44.204	+ .166	- 3 53	47.54	-1.01		1.035509
70 11 21.19	0911.69579	H	3 32	46.968	+ .117	- 4 17	29.21	+0.54		1.040951
70 11 22.19	0912.69256	W	3 32	03.182	+ .123	- 4 22	29.34	+0.71		1.042851
70 12 01.16	0921.66375	D	3 25	56.602	+ .134	- 4 50	04.65	-0.53		1.069378
70 12 03.15	0923.65747	R	3 24	45.411	+ .087	- 4 51	52.31	-0.51		1.077496
70 12 05.15	0925.65124	I	3 23	39.307	+ .151	- 4 52	06.54	+0.06		1.086380
70 12 07.14	0927.64508	I	3 22	38.595	+ .138	- 4 50				1.096006
70 12 08.14	0928.64203	T	3 22	10.425	+ .136	- 4 49	38.94	-0.49		1.101091
70 12 15.12	0935.62115	D	3 19	37.832	+ .152	- 4 31	23.14	+0.40		1.141481
70 12 27.08	0947.58769	J	3 18	37.227	+ .093	- 3 24	50.37	-0.46		1.228249
70 12 28.08	0948.58504	R	3 18	44.358	+ .107	- 3 17	34.57	+0.31		1.236365
70 12 29.08	0949.58241	R	3 18	53.386	+ .119	- 3 10	05.67	+0.76		1.244604
70 12 30.07	0950.57981	G	3 19	04.315	+ .132	- 3 02	24.35	+0.33		1.252964
70 12 31.07	0951.57723	S	3 19	17.105	+ .127	- 2 54	30.71	-0.37		1.261443

VESTA

69 11 07.48	0532.98040	J	9 29	29.165	+ .169	+16 31	44.05	-0.66		2.382285
69 11 16.46	0541.96223	L	9 38	44.335	+ .156	+16 10	25.62	-0.65		2.257712
69 11 17.46	0542.96015	B	9 39	41.127	+ .139	+16 08	31.21	-0.91		2.243874
69 11 21.45	0546.95173	P	9 43	17.919	+ .139	+16 01	57.61	-0.32		2.188644
69 11 22.44	0547.94960	A	9 44	09.469	+ .173	+16 00	35.87	+0.13		2.174879

VESTA

Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)	Distance
244			h m s	s			° ' "	"		
69 11 23.44	0548.94745	X	9 44	59.860	+ .152	+15 59	20.17	-0.32		2.161136
69 11 24.44	0549.94529	B	9 45	49.149	+ .155	+15 58	11.69	-0.54		2.147418
69 11 25.44	0550.94311	C	9 46	37.268	+ .128	+15 57	10.49	-0.70		2.133726
69 11 29.43	0554.93428	A	9 49	38.047	+ .154	+15 54	21.70	-0.90		2.079282
69 11 30.43	0555.93203	C	9 50	20.169	+ .154	+15 53	59.22	-1.02		2.065767
69 12 03.42	0558.92521	J	9 52	18.821	+ .139	+15 53	43.11	-0.23		2.025493
69 12 06.41	0561.91825	J	9 54	05.539	+ .184	+15 54	44.52	-0.60		1.985704
69 12 18.38	0573.88890	J	9 59	01.225	+ .191	+16 13	16.55	-0.54		1.833435
69 12 20.38	0575.88376	P	9 59	28.608	+ .123	+16 18	44.35	-1.04		1.809436
69 12 25.37	0580.87056	L	10 00	08.180	+ .173	+16 35	31.84	-0.56		1.751587
70 01 04.34	0590.84265	L	9 59	16.051	+ .181	+17 22	31.09	-0.68		1.646830
70 01 06.33	0592.83682	A	9 58	43.960	+ .180	+17 33	59.44	-1.34		1.627932
70 01 13.31	0599.81576	P	9 55	54.938	+ .205	+18 19	07.77	-0.38		1.568123
70 01 28.26	0614.76752	L	9 45	24.358	+ .205	+20 14	05.07	-0.41		1.478253
70 01 31.25	0617.75746	J	9 42	42.637	+ .175	+20 38	24.47	-0.33		1.467258
70 02 01.25	0618.75409	L	9 41	46.817	+ .201	+20 46	30.12	-0.30		1.464142
70 02 07.23	0624.73366	B	9 35	56.380	+ .264	+21 34	16.60	+0.03		1.451328
70 02 08.23	0625.73023	L	9 34	56.086	+ .214	+21 42	00.31	-0.62		1.450182
70 02 13.21	0630.71307	C	9 29	52.168	+ .208	+22 19	10.19	-0.79		1.448682
70 02 18.19	0635.69595	C	9 24	51.667	+ .205	+22 53	05.46	-0.65		1.454118
70 02 21.18	0638.68575	B	9 21	57.272	+ .226	+23 11	33.24	-0.24		1.460608
70 02 22.18	0639.68236	A	9 21	00.601	+ .243	+23 17	21.47	-0.38		1.463295
70 02 25.17	0642.67227	C	9 18	15.834	+ .172	+23 33	40.48	-0.39		1.472889
70 02 27.16	0644.66560	C	9 16	31.273	+ .220	+23 43	35.82	-0.91		1.480532
70 02 28.16	0645.66229	L	9 15	40.694	+ .192	+23 48	16.68	-0.48		1.484719
70 03 01.15	0646.65899	J	9 14	51.393	+ .189	+23 52	44.76	-0.86		1.489144
70 03 02.15	0647.65571	L	9 14	03.445	+ .210	+23 57	01.66	-0.42		1.493805
70 03 07.13	0652.63954	P	9 10	25.264	+ .205	+24 15	22.36	-0.41		1.520509
70 03 14.11	0659.61770	L	9 06	29.315	+ .244	+24 32	29.47	-1.17		1.566627
70 03 15.11	0660.61466	R	9 06	02.779	+ .189	+24 34	09.08	-0.40		1.573964
70 03 16.11	0661.61165	A	9 05	38.136	+ .147	+24 35	36.97	+0.29		1.581473
70 03 17.10	0662.60866	D	9 05	15.477	+ .201	+24 36	51.49	-0.69		1.589151
70 03 24.08	0669.58833	R	9 03	29.971	+ .189	+24 40	29.70	-1.18		1.647209
70 03 25.08	0670.58551	Z	9 03	22.582	+ .190	+24 40	18.67	-0.65		1.656068
70 03 26.08	0671.58272	B	9 03	17.121	+ .202	+24 39	57.28	-0.45		1.665055
70 03 28.07	0673.57720	L	9 03	11.903	+ .204	+24 38	43.37	-0.95		1.683398
70 03 29.07	0674.57447	R	9 03	12.140	+ .207	+24 37	51.86	-1.07		1.692747
70 04 01.06	0677.56642	L	9 03	24.186	+ .247	+24 34	21.09	-0.40		1.721457
70 04 04.05	0680.55856	B	9 03	52.808	+ .179	+24 29	26.07	-0.79		1.751079
70 04 06.05	0682.55342	W	9 04	21.056	+ .206	+24 25	25.12	-0.67		1.771281
70 04 09.04	0685.54587	C	9 05	16.758	+ .205	+24 18	19.20	-0.59		1.802186
70 04 12.03	0688.53850	R	9 06	27.961	+ .159	+24 09	58.83	-0.68		1.833715
70 04 13.03	0689.53608	D	9 06	55.054	+ .165	+24 06	56.47	-0.39		1.844347
70 04 19.02	0695.52196	R	9 10	10.875	+ .166	+23 46	02.35	-0.77		1.909180
70 04 21.01	0697.51739	B	9 11	28.233	+ .194	+23 38	07.13	-0.40		1.931117
70 04 26.00	0702.50626	R	9 15	06.080	+ .155	+23 16	18.66	-0.40		1.986477

SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS 19

MOON

Lun.	Date	J.E.D.	O L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)
		244		h m s	s			° ' "	"	
576	69 07 27.13	0429.63584	G 1	18 25	55.213	2.012	S	-28 17 45.40	+1.96	
	69 07 31.30	0433.80219	E 2	22 41	52.248	1.456	N	- 9 32 51.01	+10.94	
	69 08 01.33	0434.83596	L 2	23 34	34.730	1.399	N	- 2 37 14.52	+9.09	
577	69 08 21.99	0455.49653	R 1	16 47	15.392	1.859		-27 37		
	69 08 23.04	0456.54068	C 1	17 54	57.292	1.793	S	-28 38 18.05	+0.38	
	69 08 24.08	0457.58577	Q 1	19 04	00.444	1.842	S	-27 29 25.38	+3.68	
	69 08 25.12	0458.62962	W 1	20 11	15.873	1.686	S	-24 14 04.71	+7.19	
	69 08 26.17	0459.67072	K 1	21 14	33.141	1.613	S	-19 13 34.57	+9.82	
	69 08 27.20	0460.70866	L 1	22 13	16.540	1.478	S	-12 59 48.88	+10.08	
	69 08 30.30	0463.80960	Q 2	0 50	51.284	1.368		+ 7 44		
	69 08 31.34	0464.84190	L 2	1 41	25.949	1.403	N	+13 57 42.14	+8.71	
	69 09 01.37	0465.87479	A 2	2 32	52.377	1.452	N	+19 19 44.02	+7.15	
578	69 09 22.07	0486.57884	R 1	20 48	19.748	1.617	S	-21 32 48.57	+8.02	
	69 09 23.11	0487.61692	K 1	21 47	15.416	1.561	S	-15 56 32.53	+9.80	
	69 09 24.15	0488.65243	R 1	22 42	28.757	1.523	S	- 9 25 57.60	+11.07	
	69 09 27.25	0491.75118	C 2	1 16	53.052	1.394	N	+11 02 24.87	+9.32	
	69 09 29.31	0493.81826	L 2	3 01	38.371	1.478	N	+21 49 08.31	+6.05	
	69 09 30.35	0494.85353	K 2	3 56	30.201	1.497		+25 30		
	69 10 01.39	0495.88975	R 2	4 52	44.765	1.465		+27 48		
	69 10 03.46	0497.96238	R 2	6 45	30.613	1.467		+28 01		
579	69 10 18.99	0513.49127	W 1	20 28	20.181	1.491	S	-22 59 47.45	+6.01	
	69 10 20.02	0514.52928	L 1	21 27	09.591	1.523	S	-17 56 17.75	+8.43	
	69 10 21.06	0515.56458	K 1	22 22	04.177	1.336	S	-11 53 08.76	+10.38	
	69 10 22.09	0516.59785	A 1	23 14	03.343	1.408	S	- 5 15 43.03	+11.13	
	69 10 24.16	0518.66184	R 1	0 54	20.130	1.348		+ 8 11		
	69 10 25.19	0519.69424	A 1	1 45	03.348	1.402	N	+14 20 10.28	+9.01	
	69 10 26.22	0520.72776	W 2	2 37	24.106	1.523	N	+19 40 36.61	+7.46	
	69 10 27.26	0521.76269	L 2	3 31			N	+23 55 52.16	+5.57	
	69 10 30.37	0524.87248	W 2	6 22	08.327	1.537	N	+28 18 41.24	-1.85	
	69 10 31.40	0525.90807	L 2	7 17	28.281	1.469	S	+26 51 13.54	-2.96	
580	69 11 15.94	0541.44355	A 1	21 09	49.121	1.565	S	-19 22 19.44	+8.83	
	69 11 16.97	0542.47948	W 1	22 05	38.484	1.428	S	-13 35 50.55	+9.99	
	69 11 19.04	0544.54464	L 1	23 47	36.817	1.308	S	- 0 33 39.81	+11.34	
	69 11 21.10	0546.60726	D 1	1 25	54.565	1.329	S	+12 11 34.61	+9.54	
	69 11 22.14	0547.63972	W 1	2 16	43.637	1.360	S	+17 43 58.48	+7.71	
	69 11 23.17	0548.67367	L 1	3 09	41.636	1.474		+22 20		
	69 11 25.24	0550.74585	C 2	5 01	48.588	1.597	N	+27 48 12.04	+1.30	
	69 11 29.38	0554.88639	A 2	8 40	30.234	1.310	S	+21 43 27.39	-6.59	
	69 11 30.41	0555.91716	C 2	9 28	52.818	1.276	S	+17 23 19.08	-9.99	
	69 12 02.47	0557.97486	D 2	11 00	04.768	1.286	S	+ 6 44 00.98	-10.56	
581	69 12 14.92	0570.42768	A 1	22 41	13.880	1.379	S	- 9 00 45.50	+10.51	
	69 12 15.96	0571.46030	L 1	23 32	16.665	1.338	S	- 2 19 58.40	+10.95	
	69 12 16.99	0572.49167	A 1	0 21	31.282	1.322	S	+ 4 17 09.05	+10.16	
	69 12 18.02	0573.52280	K 1	1 10	24.682	1.307	S	+10 33 26.96	+9.07	
	69 12 20.08	0575.58753	W 1	2 51	45.974	1.409		+21 03		
	69 12 23.19	0578.69470	D 1	5 38	20.552	1.503	N	+28 16 58.44	-0.35	
	69 12 25.26	0580.76641	L 2	7 29	46.754	1.451	N	+25 58 28.75	-5.97	
	70 01 01.47	0587.97409	L 2	12 57	14.710	1.244		- 9 05		
582	70 01 17.03	0603.53654	W 1	3 28	31.871	1.390		+23 57		
	70 01 28.38	0614.88860	L 2	12 40	15.200	1.232	S	- 7 09 47.07	-9.51	
	70 01 31.48	0617.98595	J	15 12			S	-22 59 25.84	-6.62	
583	70 02 13.98	0631.48519	P 1	4 04	46.945	1.481		+26 07		
	70 02 18.12	0635.62841	C 1	7 47	21.245	1.351	N	+25 07 18.03	-5.00	
	70 02 21.22	0638.72100	B 1	10 12	52.577	1.162	N	+12 08 12.50	-9.87	
	70 02 22.24	0639.74918	A 2	10 57	30.019	1.209	S	+ 6 31 52.01	-9.87	
	70 02 24.30	0641.80500	A 2	12 25	58.962	1.230	S	- 5 21 58.77	-10.56	
	70 02 25.33	0642.83414	J 2	13 12	00.167	1.270	S	-11 14 37.30	-10.32	
	70 02 27.39	0644.89891	W 2	14 53	25.284	1.522	S	-21 36 52.83	-7.86	
	70 02 28.43	0645.93591	L 2	15 50	47.506	1.664	S	-25 27 17.79	-5.78	

20 SIX-INCH TRANSIT CIRCLE OBSERVATIONS OF THE SUN, MOON, AND PLANETS

MOON

Lun.	Date	J.E.D.	O	L	Obs.	R.A.	(O-C)	L	Obs.	Decl.	(O-C)
		244			h m s	s			° ' "	"	
584	70 03 17.04	0662.54161	D	1	7 28	27.884	1.475	N	+26 06	08.81	-4.83
	70 03 18.07	0663.57490	Z	1	8 20	28.905	1.436	N	+23 00	25.40	-7.83
	70 03 24.24	0669.74983	C	2	12 56	42.823	1.295	S	- 9 19	12.95	-10.33
	70 03 25.28	0670.78058	W	2	13 45	04.271	1.397	S	-15 02	29.42	-9.76
	70 03 26.31	0671.81375	J	2	14 36	54.257	1.630	S	-20 10	34.45	-7.64
	70 03 27.34	0672.84986	P	2	15 32	59.129	1.686		-24 22		
	70 03 30.47	0675.97313	L	2	18 42	48.658	1.846		-27 43		
585	70 04 16.04	0692.54966	D	1	9 38	21.524	1.256	N	+15 55	30.06	-9.29
	70 04 19.13	0695.63475	R	1	11 53	03.546	1.244	N	- 0 57	47.66	-10.36
	70 04 22.22	0698.72685	J	2	14 17	52.869	1.527	S	-18 21	36.77	-8.86
	70 04 23.26	0699.76262	P	2	15 13	28.251	1.586	S	-22 58	48.21	-6.56
586	70 05 13.99	0720.49175	Z	1	10 05	08.456	1.178	N	+12 42	34.71	-9.45
	70 05 19.13	0725.63744	H	1	13 55	13.048	1.416	N	-16 08	20.05	-8.25
	70 05 20.17	0726.67229	L	1	14 49	29.295	1.534	S	-21 09	24.56	-7.18
	70 05 21.21	0727.71063	C	1	15 48	47.919	1.630	S	-25 06	54.48	-6.18
	70 05 23.29	0729.79582	J	2	17 59	41.542	1.919	S	-28 05	29.01	+0.21
	70 05 27.45	0733.95622	L	2	22 07	04.135	1.557	N	-12 21	06.23	+9.41
587	70 06 14.01	0751.51716	H	1	12 44	02.810	1.292	N	- 8 04	52.71	-9.78
	70 06 15.04	0752.54746	G	1	13 31	44.748	1.362	N	-13 47	23.71	-8.26
	70 06 22.33	0759.83110	J	2	20 48	54.513	1.722	N	-20 05	19.73	+8.10
	70 06 23.36	0760.86924	P	2	21 47	55.739	1.580		-14 16		
	70 06 24.40	0761.90461	J	2	22 42	55.841	1.455	N	- 7 42	35.86	+9.12
588	70 07 17.14	0784.64822	R	1	18 03	24.388	1.826		-28 02		
	70 07 19.23	0786.73667	P	2	20 19	00.565	1.838		-22 23		
589	70 08 12.00	0810.50951	F	1	16 25	37.297	1.679		-26 59		
	70 08 13.05	0811.55147	I	1	17 30	09.619	1.718	S	-28 13	17.20	-0.51
	70 08 16.18	0814.68126	F	1	20 49	24.069	1.713	S	-19 57	46.74	+9.12
	70 08 22.39	0820.89876	I	2	2 27	06.600	1.430	N	+19 44	18.72	+6.54
590	70 09 12.08	0841.58557	R	1	20 17	40.133	1.708	S	-22 30	05.74	+6.54
	70 09 13.12	0842.62548	J	1	21 19	14.141	1.636	S	-17 09	18.04	+10.46
	70 09 14.16	0843.66339	G	1	22 17	55.625	1.595	S	-10 36	42.96	+11.11
	70 09 15.19	0844.69974	H	1	23 14	21.036	1.508		- 3 23		
	70 09 16.23	0845.73527	F	2	0 09	36.212	1.444		+ 3 59		
	70 09 17.27	0846.77084	I	2	1 04	53.747	1.533		+11 01		
	70 09 20.38	0849.88307	G	2	3 58	47.552	1.637	N	+25 53	03.33	+3.78
	70 09 21.42	0850.92205	Z	2	4 59	01.044	1.595	N	+27 49	37.31	+0.26
	70 09 22.46	0851.96054	H	2	5 58	31.614	1.673		+28 07		
591	70 10 07.95	0867.45390	H	1	18 50	03.678	1.713	S	-26 58	20.53	+3.45
	70 10 11.07	0870.57100	I	1	21 50	57.911	1.619	S	-13 40	34.50	+10.15
	70 10 12.10	0871.60685	D	1	22 46	40.739	1.524	S	- 6 56	37.65	+12.05
	70 10 13.14	0872.64192	H	1	23 41	15.416	1.558	S	+ 0 14	28.02	+11.95
	70 10 14.17	0873.67704	J	1	0 35	54.678	1.568	S	+ 7 24	41.40	+11.83
	70 10 17.28	0876.78931	W	2	3 29	51.571	1.774	N	+24 13	25.73	+5.14
	70 10 18.32	0877.82926	G	2	4 31	28.437	1.755	N	+26 59	39.72	+4.51
	70 10 19.36	0878.86917	I	2	5 33	02.811	1.684	N	+28 01	19.15	-0.20
	70 10 20.40	0879.90781	D	2	6 32	47.168	1.656		+27 22		
592	70 11 06.98	0897.48335	W	1	21 30	51.274	1.538	S	-15 37	06.64	+9.10
	70 11 08.01	0898.51844	F	1	22 25	28.145	1.429	S	- 9 23	25.04	+12.24
	70 11 09.05	0899.55247	H	1	23 18	32.230	1.459	S	- 2 36	11.56	+11.09
	70 11 10.08	0900.58630	R	1	0 11	19.893	1.528	S	+ 4 21	27.82	+11.63
	70 11 17.35	0907.85328	J	2	7 04	26.438	1.565		+26 08		
	70 11 18.38	0908.88884	I	2	7 59	43.803	1.501	S	+23 14	55.40	-8.11
	70 11 21.48	0911.98045	H	2	10 23	49.742	1.241		+ 9 27		
593	70 12 07.00	0927.50014	I	1	23 53	22.789	1.410		+ 2 15		
	70 12 08.03	0928.53340	T	1	0 45	20.837	1.484		+ 8 54		
	70 12 09.06	0929.56777	P	1	1 38	54.828	1.533	S	+15 03	30.05	+9.74
	70 12 15.29	0935.79827	J	2	7 35	24.067	1.507	S	+24 30	08.20	-5.10
	70 12 16.33	0936.83256	F	2	8 28	51.413	1.358	S	+20 55	55.73	-5.43
	70 12 19.42	0939.92142	J	2	10 48	59.331	1.166	S	+ 6 00	12.80	-9.00